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Gulf, Texas Co. Pool Vapor Phase Patents; Build Joint Commercial Plant

By Paul Truesdell
N. P. N. STAFF WRITER

Article 1

CLEVELAND, Nov. 28 THE Gulf Refining Co. and The Texas Co. have pooled their patent interests covering vapor phase cracking and for several months have been carrying on a joint research and development program. This work will culminate very shortly in the starting up of a commercial sized vapor phase cracking plant jointly owned by the two companies. This plant, construction of which is said to be nearly completed, is at the Bayonne refinery of the Gulf Refining Co.

There are 23 patents in the pool, 12 of them put in by The Texas Co. and 11 by the Gulf. The Texas Co. patents were issued in the name of Frank W. Hall and those of the Gulf in the name of C. M. Alexander.

The vapor phase development work of the two companies is in charge of Luis de Florez, a consulting refinery engineer with headquarters in New York. He is one of the pioneers in vapor phase cracking, having worked with Hall in England in the development of a vapor phase cracking process which was used extensively for the manufacture of toluol for explosives during the war. He also built a vapor phase cracking plant at the refinery of the New England Oil Refining Co., Fall River, Mass. He is known also as the developer of a method of temperature control of cracking and other stills which he described in NATIONAL PETROLEUM NEWS, Sept. 21 issue, page 105.

The joint project of these two big refining companies is the latest feature to come to light in the rapidly marching development of the vapor phase cracking situation.

Earlier recent deevlopments which were covered in the columns of NATIONAL PETROLEUM NEWS are:

A statement by William G. Leamon to the Independent Oil Men of America at their meeting in Chicago that his vapor phase cracking process which has been working for three or four years at Newark, O., is capable of turning out on a commercial scale a product equal in all respects and superior in some respects to Ethyl gasoline (page 17, Nov. 2 issue of N.P.N.)

An announcement by the Pure Oil Co. that its vapor phase cracking process, known as the Gyro process, is in successful commercial operation at its Cabin Creek, W. Va., plant (page 20 Nov. 16 issue of N.P.N.)

A Series on Vapor Phase Cracking

The accompanying is the first of a series of articles by Paul Truesdell on this very important subject. Herewith is presented a very important development, the pooling by two big companies of 23 patents on vapor phase cracking and joining of their forces on a development program.

Subsequent articles in this series will discuss what seem to be the most important patents bearing on the subject and will follow further practical developments of vapor phase cracking in terms of actual refinery operation, as far as these are available.

AS THE matter now stands, three major figures stand out in the field as announced owners of vapor phase cracking processes. These are the Gulf-Texas pool; the Pure Oil Co.; and the Leamon Process Co. The latter two have plants said to be operating successfully. What other companies may be doing they are keeping pretty well under cover.

Among the technologists who pioneered vapor phase cracking, Walter F. Rittman stands out. He took out several patents covering a process while he was with the Bureau of Mines in 1916. However, his process never gained commercial success for cracking oil. Dr. Rittman has not been active in the inventive and development field for several years. He is now head of the department of engineering at the Carnegie Institute of Technology, Pittsburgh, and a consulting engineer in petroleum and other industries.

Other investigators who have done considerable work in this field are Greenstreet and Ramage.

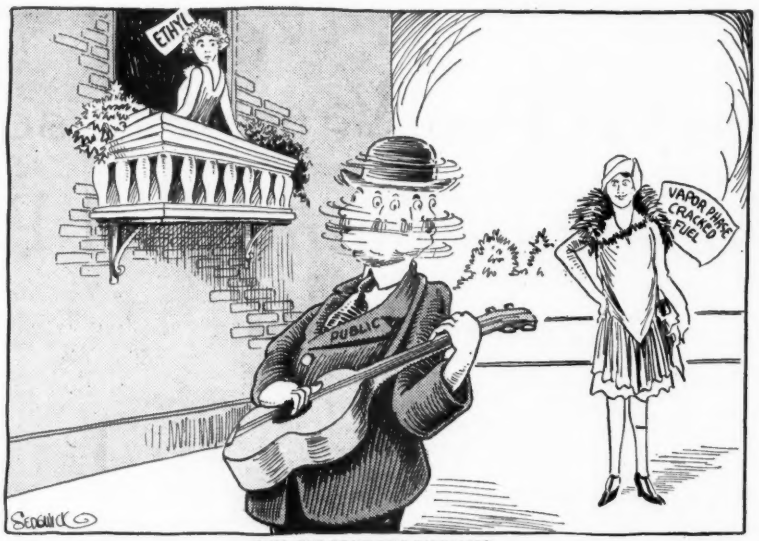
Technologists who have made a study of vapor phase cracking are

divided into two schools; those who pin their faith to the use of catalysts to accomplish the conversion of the hydrocarbons in conjunction with high temperature, and those who declare that catalysts have no virtue whatever. There seems to be no middle ground. Some processes operate under relatively low pressures and others substantially at atmospheric.

Leamon's is the first commercially operating process whose success is claimed to be based on the use of a catalyst. There are no patents issued covering this process although there are said to be a number of applications in the patent office. Mr. Leamon keeps the name and nature of the catalyst he uses a secret.

The Pure Oil Co. in the Gyro process uses in each tube of the convertor a core of concrete impregnated with iron oxide, the latter being the catalyst. Both Leamon and the Pure Oil technologists assert that tests have shown that they cannot get the same results in their processes when the catalysts are omitted.

On the other hand, Rittman, de Florez and others hold that the introduction of a catalyst has no effect one way or the other. They state that cracking in the vapor phase is a simple matter, basically, depending upon very rapid transfer of heat into the vapors. In order to operate successfully, members of this school point out, exceedingly high velocity is necessary, something of the order of 200 feet a second, as compared with velocities of the order of perhaps 40 or 50 feet per second in the average liquid phase cracking operation.



WILL SHE BEAT ETHYL'S TIME?

THE high velocity is said to be needed for two reasons, one is to carry the heat from the tube metal into the vapors at a sufficiently rapid rate to prevent the burning of the tubes and the other is to prevent the deposit of carbon. Another feature of which a great point is made is the necessity of having the inside surfaces of the tubes as smooth as possible and the return bends designed to present the smallest possible frictional resistance to the rapid flow of the vapors.

So far, no announcement has been made by the Gulf and The Texas Co. of their joint program. They have issued no warnings, so far as known, to other refining companies that their patents are being infringed. From this it might be inferred that the alliance between these two strong companies is more a defensive than an offensive alliance.

It is rumored throughout the industry that a certain interest holding numerous patents on liquid phase cracking has for several years been filing applications covering various points in vapor phase cracking with the intention of attempting to dominate this field if and when circumstances drive refiners generally to adopt it.

It is believed that most of the big refining companies who have been involved in one way or another in the confusion and strife that marks the liquid phase cracking patent situation have had a plenty of litigation. Whether those companies directly interested in lawsuits over liquid phase cracking patents win or lose their suits, many of them feel keenly the censure and bitterness that has been directed against them because of the patent litigation.

As to the extent to which vapor phase cracking will grow, there is some difference of opinion. Most technologists are agreed that the high compression engine is here and that the tendency will be toward higher compressions, up to a certain limit, although there are some dissenters from this view.

High compression, it is generally held by most technologists, means anti-knock fuel which in turn will mean in a short time either Ethyl gasoline or the product of vapor phase cracking stills. It is generally conceded that the manufacturing cost of vapor phase gasoline of very high anti-knock value is always going to be considerably more expensive than the production of the liquid phase cracked product. There is some question in the minds of economists and technologists whether the logical answer in some cases at least, will not be to make a gasoline by straight distillation and liquid phase cracking of as high anti-knock value as is consistent with big yield, an anti-knock value of such an order that only a very small admixture of Ethyl fluid would be necessary to bring it to a satisfactory standard, and then add the required Ethyl fluid. It will all rest on a dollars and cents basis point.

It would appear that at least two vapor phase cracking processes are now available for license by refiners. Mr. Leamon and the Pure Oil Co. have both announced that they are willing to license the use of their processes. The attitude of the Gulf-Texas Co. pool on permitting the use of their joint process by other companies is not known.

Another point that will have a good deal of bearing on the question of the economy of operating vapor phase cracking processes by licensees is likely to be the question of royalty. None of the companies owning processes has as yet announced the royalty rate it proposes to charge. If it is high it may drive more refiners and marketers to Ethyl gas in order to meet the demand of their customers for anti-knock fuel.

That the superior value of cracked gasoline was appreciated by some, even in the days when refiners generally made their big play to the trade on straight run gasoline and tried to hide the fact that they were selling a cracked produce, is shown in bulletin 114 of the Bureau of Mines, published in 1916. The booklet is entitled, "Manufacture of Gasoline and Benzene-Toluene from Petroleum and Other Hydrocarbons", and its authors are W. F. Rittman, C. B. Dutton and E. W. Dean. In that bulletin this statement is made:

"Another objection made to cracked gasolines has been the alleged fact that such gasolines deposit larger quantities of soot in the cylinders of internal combustion engines than do uncracked gasoline distillates. It is conceivable that such a deposit may be due to improper combustion which occurs because the nature of the product is unknown.

"Hall[1] who has investigated this subject has stated that such soot deposition is attributable to this cause, the mixture used being too rich. His investigations tend to show that a properly cracked gasoline or motor spirit gives greater mileage than a gasoline distillate which he explains on the ground that the cracked gasoline burns more slowly than the 'straight' distillate thereby imparting

(*Continued on Page* 25)

1 Hall, W. A., Address delivered to Institution of Petroleum Technologists, London, Feb. 18, 1915.

Yates Field Prorating Yardstick On Acreage Basis Proposed

By Paul Wagner

N. P. N. STAFF WRITER

BULLETIN

HOUSTON, Nov. 28.—Two wells in Yates field of Pecos county added 75,000 barrels rated potential production to the West Texas region over Sunday. One was the California Co.'s No. 7 Yates in the SW of section 34, which at usual drilling depth tested 1,800 barrels in the first hour. The other was the No. 1 Yates of the McMan and Marland partnership which made 1,200 barrels the first hour after deepening 14 feet to total depth of 1,327 feet. Humble Oil & Refining Co.'s well in the NE corner of section 101 had increased its capacity to 155 barrels on an hourly test.

HOUSTON, Nov. 26

AN OFFICIAL statement issued by W. A. Moncrief as chairman of the Pecos county prorating committee after a Fort Worth meeting, Nov. 25, says:

"Gossip has been recently going the rounds to the effect that the present plan of prorating the potential production to pipeline outlet in the Yates field is likely to be discontinued on account of the recent completion of a 6-inch line by the Gulf Production Co., from the pool to its loading rack at Rankin, Texas.

"On the contrary, the proration committee at Friday's meeting favored extending the proration principle beyond Jan. 1, the date of expiration of the present agreement. Several additional bases of proration were discussed, the one most favorably received being a plan to prorate pipeline outlet on the basis of current proven productive acres.

"To this end, a competent consulting geologist has been employed by the executive committee to define the present productive area in collaboration with the respective geological departments for the operators involved."

ALTHOUGH the proposed change to an acreage basis for prorating runs has yet to be ratified by executive heads of companies operating in the field it was a general belief after Friday's meeting that this plan soon would take the place of the present system of prorating on a potential production basis.

Use of the proposed acreage basis for allocation of equitable runs to the limited market outlets for Yates field crude would eliminate competitive drilling on the part of operators seeking to build up their potential rating in order to gain higher percentages of pipeline runs.

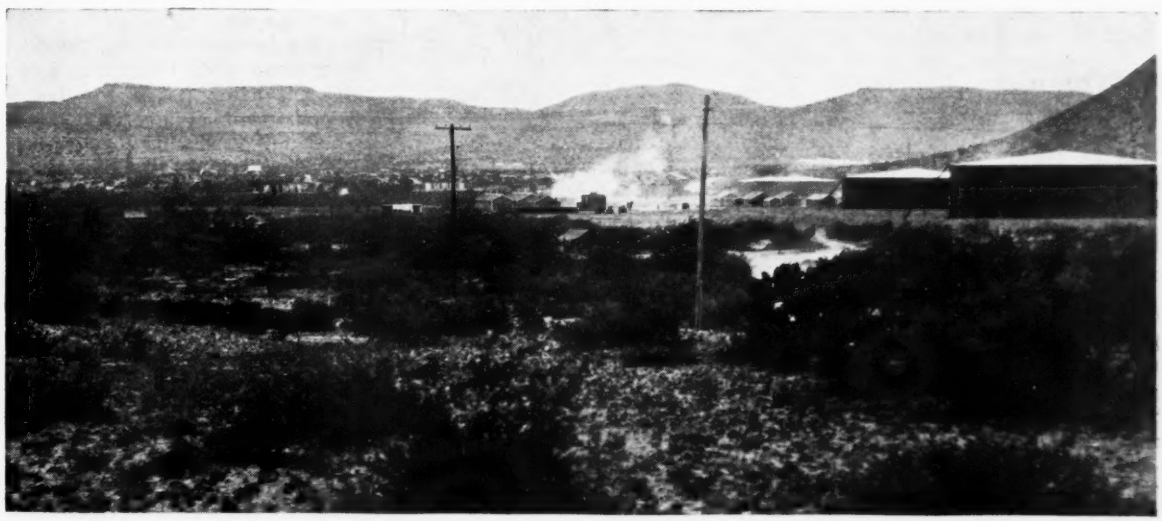
Present field outlet through pipelines of companies subscribing to the prorating plan totals 42,000 barrels of crude daily. Of this total, 30,000 barrels daily goes to the Humble Pipeline Co., and 12,000 barrels daily to the Illinois Pipeline Co., companion corporation of the Mid-Kansas Oil & Gas Co.

A 6-inch outlet of the Gulf Pipeline Co., extending from the field to tank car loading racks at Rankin, is handling oil from the Gulf's newly completed well on the Runnels county school land tract in the northwest part of the field. The Gulf is not a subscriber to the prorating agreement, but despite its independent action is expected to continue operations on a conservative basis.

It is said unofficially the Gulf has no desire to see the Yates field prorating plan broken up, but its policy always has been to hold aloof from entering into agreements and, further, the Gulf operates its pipeline facilities solely for the purpose of running its own controlled crude.

The belief is also stated, although the Gulf never makes official statements about its policy, that proration on an acreage basis will be considered more favorably by it than the existing system of establishing percentage runs on potential production.

DISCUSSION at Friday's prorating committee meeting with regard to proved acreage in the Yates field was on the basis of 11,000 acres definitely considered productive. This took account of the Gulf's new well, which extended the field to the northwest when it came in at 1369 feet, putting 60 barrels an hour into the pipe-



Illinois Pipeline Co. Pump Station in Yates field, Pecos County, Texas, showing some of the companion Mid-Kansas Oil & Gas Co. wells at left

Topography in northwest part of Yates field development, Pecos County, Texas., showing roads through hills and operations on leaseholds of Simms, McMan and California companies

line. Since then the Humble Oil & Refining Co. has completed a south offset in sec. 101, making 60 barrels in the first hour; and about a half mile west the Kirby Petroleum Co.'s first test in sec. 108 is flowing by heads in an incompleted stage.

Yates field operators as a whole favor continuance of prorating, in some form, as far into the future as necessary to prevent the building of field storage for high sulfur content crude.

Phillips to Sell Borger Oils from Bartlesville

TULSA, Nov. 28.—General sales offices for the Borger, Texas, refinery of the Phillips Petroleum Co. will be at Bartlesville, Okla., it was announced this week by H. A. Trower, vice-president in charge of sales. The Amarillo office will be maintained as a branch sales office directed by O. W. Crick.

The Phillips Petroleum Co. has standardized on a 60-62 gravity 420 end point gasoline as the product which will be marketed from the plant. Fuel oil will be the only other product.

Work is to begin at once on the enlargement of the refinery which was recently purchased from the Alamo Refining Co. M. P. Youker will be in charge of construction and operations.

Goes to Tulsa on Gas-Lift Case

LOS ANGELES, Nov. 26.—R. P. McLaughlin of the firm of Jones-McLaughlin, Inc., owners of the so-called gas lift patent, left today for Tulsa. This firm recently filed suits against certain large oil companies in the Mid-Continent charging infringement of their patent in the operation of the gas lift, and this matter will be called in court in Tulsa, Dec. 1.

80-Year Old Oil Worker Gets Service Medal

GRANTSVILLE, W. Va., Nov. 22.—A distinguished service medal for long and efficient service in the oil industry, was presented on Nov. 10 at the Lions Club of Grantsville in behalf of the club and by request of the International Petroleum Exposition, to Thomas Collins, aged 80, who has been in the industry since early childhood. Mr. Collins was the guest of honor at the club on this occasion and presentation of the medal was made by Albert G. Matthews of the club.

Among Mr. Collins' early acquaintances in the oil business were John D. Rockefeller, Pat Boyle, Pat O'Shay and Dan O'Day. While very young, Mr. Collins began as a driller in Mercer county, Pa., at $1 per day. He worked consecutively with Nelson, Jones & Nickum in Venango county, with Halterman & Speers at Oil City, with Schamburg & Stewart on Cherry Run, with McGee & Rowley on Church Run and in territory surrounding the Drake well, with Smullin & Neeley, H. L. Taylor & Co., and Prentiss & Co.

He then went to Bradford where he engaged in contracting, and later moved to Bowling Green, O., where he entered the employe of the Ohio Oil Co.

He was after that for many years with the South Penn Oil Co. in Wetzel county, W. Va., in Tyler and Calhoun counties. At the age of 65 years, the South Penn company retired him on annuity. After a short retirement, Mr. Collins again went to the work, this time with the Carter Oil Co., pumping wells on the Hardman lease near Big Bend, W. Va., which position he occupied until about two years ago when the eastern division of that company was absorbed by the Hope Construction & Refining Co. Mr. Collins has now retired from active service.

When he was 21, Mr. Collins married Miss Ellen Hurley. During his stay in Bowling Green, Mrs. Collins died, and their six children were already grown up and married. In 1917, Mr. Collins married Miss Charlotte Jane Jackson, 16, who is claimed to be a lineal descendant of "Old Hickory" Jackson. Two children, Thomas Jefferson and Martha Washington, aged three years and eight months respectively, have been born to them.

M. F. Waters is Elected Vice-President

TULSA, Nov. 28.—M. F. Waters, for the past three years manager of Smith Separator Co., was elected vice president by the board of directors today. Mr. Waters has been with the company for the past six years.

He formerly was in the Traffic Department of Chestnut and Smith Corp., after being in the operating department of Frisco and with various oil producing companies operating in Texas and Louisiana.

Mr. Waters has built up the company's business since he became manager to where 21 salesmen are now employed in the Mid-Continent. The company also is district sales agent for Fisher Governor Co., Victaulic Co. of America, Everyday Protector Tubing Catcher, Waters Gauge Cock and Reed Air Filter.

LOS ANGELES, Nov. 26.—Henry Bourne Jr., recently arrived in Los Angeles as district sales manager for the A. O. Smith Corp. in California; offices are at 1108 Commercial Exchange building.

Texas Jobbers Relate Own Experiences

FORT WORTH, Nov. 25

MERCHANDISING methods the Independent marketing company can use in competition with the major oil companies were analyzed in discussion at the meeting of the Texas Independent Oil Men's Association at Fort Worth Nov. 21 and 22. The gasoline marketing situation has been acute in this state, as in many others, on account of price cutting by some companies to increase their gallonage.

Some marketers present at the meeting were of the opinion that the company which put real effort into its sales work, carried on an advertising program consistently and handled quality products was meeting the lower priced competition in the best manner. Others held to the necessity of offering premiums of accessories or other merchandise to appeal to the bargain hunting instincts of the class of trade which patronizes the low price stations. Men with companies trying each plan took the floor in the meetings to tell of their experience.

J. B. Russ, Consolidated Oil Co., Houston, was elected president of the Texas association by the board of directors, taking the place of R. N. Mullin, Calumet Oil Co., El Paso, who refused to consider holding this office for another year. C. A. Slimp, Slimp Oil Co., San Antonio, was made first vice-president; W. M. Harrison, Star Refining & Producing Co., Fort Worth, second vice-president, and L. A. Green, Radio Petroleum Co., Fort Worth, secretary-treasurer.

Fourteen directors elected at the same meeting were: W. C. Gaylor, Gaylor Oil Co., Houston; V. H. Anderson, Savage Oil Co., El Paso; R. N. Mullin, Calumet Oil Co., El Paso; C. V. Millican, Panhandle Refining Co., Wichita Falls; R. R. Russell, Russell Oil Co., San Antonio; Floyd Casey, Home Oil Co., Waco; C. A. Slimp, Slimp Oil Co., San Antonio; J. B. Russ, Consolidated Oil Co., Houston; L. A. Green, Radio Petroleum Co., Fort Worth; W. M. Harrison, Star Refining & Producing Co., Fort Worth; J. C. Gaither, Gaither Oil Co., Fort Worth; W. R. Smith, Oriental Oil Co., Dallas; G. D. Bowers, Simms Oil Co, Dallas, and C. E. Cox, Independent Oil Co., Corpus Christi.

ONE kind of competition was discussed which exists in Texas but not as yet in other parts of the country, at least to any great extent. Individual service station owners in Fort Worth, Wichita Falls and other large places are organized to give away, through a drawing, an automobile each month. Chances on the car are given with purchases of gasoline at their stations, and the car given away depends on the volume of trade in the town over the month. A car is given away each month. In smaller places less expensive cars are given away than in the cities; but it was said there was great interest in the drawings in each case.

STATION owners coming in on this plan agree to maintain the established price, and one cent is taken from the sale of each gallon of gasoline to apply against the cost of the car.

Mr. Millican, of the Panhandle Refining Co., described how he had increased grease sales at his stations by assigning one man for several weeks to make the rounds of his stations and ask each motorist who drove in if he could examine his differential housing. In the great majority of cases, Mr. Millican said, they were found in need of refilling and a sale of grease was made. He thought this service could be featured at stations in the spring and fall.

Another suggestion made at this

Texas Jobbers at Fort Worth Meeting

Left to right (front row)—C. V. Millican, Panhandle Refining Co., Wichita Falls; L. A. Green, Radio Petroleum Co., Ft. Worth, secretary-treasurer Texas Independent Oil Men's Association; W. M. Harrison, Star Refining & Producing Co., Fort Worth, second vice-president; R. N. Mullin, Calumet Oil Co., El Paso, retiring president; Jim Russ, Consolidated Oil Co., Houston, new president; Chester Slimp, Slimp Oil Co., San Antonio, first vice-president; A. E. Blohm, Blohm Oil Co., Temple; W. C. Woody, Woody Oil & Grease Co., Wichita Falls; W. C. Gaylor, Gaylor Oil Co., Houston; V. B. Guthrie, National Petroleum News, Cleveland, Ohio; Left to right (second row)—T. G. Dabney, Wayne Pump & Tank Co., Dallas office; J. C. Gaither, Gaither Oil Co., Fort Worth; R. C. Davis, Canfield Oil Co., Cleveland, Ohio; H. W. Hirsheimer, Litwood Oil & Supply Co., Fort Worth; C. J. Reeves, Keen & Woolf Oil Co., Houston; V. H. Anderson, Savage Oil Co., El Paso; R. R. Russell, Russell Oil Co., San Antonio; W. S. Taylor, Crown Central Oil Corp., Houston; S. D. Proctor, Sinclair distributor, Teague; George D. Bowers, Sims Oil Co., Dallas; D. E. Little, Liwood Oil & Supply Co., Fort Worth; Paul Wagner, National Petroleum News, Houston

meeting was that the placing by the major marketing companies of their agents on a percentage commission basis would tend to eliminate price cutting. It was said that, under the present system used by most companies of paying agents a flat amount per gallon of gasoline distributed, the agent makes as much on low price gasoline as when prices are higher and, consequently, is sometimes influenced to cut prices to increase his gallonage and therefore his compensation. If the agent were placed on a percentage basis, ten or 15 per cent of his sales of gasoline, he would be more inclined to keep his prices up, it was believed.

V. B. Guthrie, NATIONAL PETROLEUM NEWS, spoke on marketing conditions elsewhere in the country, and Paul Wagner, NATIONAL PETROLEUM NEWS, on the outlook for crude production.

Chicago's Gallonage Sold on Involved T.W. Basis

Staff Special
CHICAGO, Nov. 26

COMPETITION for the tremendous gasoline gallonage in Chicago in the past four years has produced a schedule of wholesale tank wagon prices which has been more involved than that in effect in any other city in the country. Some points in the marketing territory of the Standard Oil Co. of Indiana have had lower tank wagon schedules than Chicago during short periods but no city has had prices which were consistently as low compared with the general level of the Indiana company's tank wagon market.

More than a year before the Standard Oil Co. of Indiana brought out its Quantity Discount Agreement, the company began making quantity prices well below the general tank wagon level. It was on March 6, 1924 that the company began allowing low prices on quantity dumps. At that time the base tank wagon was 18 cents but on dumps of 100 to 249 gallons the price was cut to 16 cents; on 250 to 499 gallons the price was 15.5 cents; and on dumps of more than 500 gallons the price was 15.25 cents, 4.75 cents below the service station price.

A month later, on April 3, the company changed its schedule to allow the 16 cent price on dumps of 100 to 199 gallons and allowed the 15.25 price for dumps of 200 gallons and over. The price was made even more liberal on May 23 when the maximum allowance of 2.75 cents under what might be called the base tank wagon schedule was allowed for dumps of 100 gallons and over.

In the fall, on Sept. 1924 the company narrowed the quantity dump allowance down to 1 cent per gallon when the base tank wagon price was cut to 14 cents on dumps of 1 to 99 gallons. This policy carried on until the Q.D.A. schedule was announced on July 1, 1925, and as a matter of fact has continued in connection with the Q.D.A. up to the present time.

At one time the tank wagon price at Chicago was taken by the trade as an index to tank wagon and retail prices for gasoline in the Middle West. It was used as a basis for a great many contracts in the Mid-Continent field in the sale of gasoline and even in the sale of natural gas. Because of its involved state in recent years neither buyer nor seller of any commodity has been willing to renew old contracts or make new agreements which involve the Chicago price.

That situation is particularly true since the Q.D.A. In the Indiana territory generally the Q.D.A. discounts are figured from the base tank wagon price. But in Chicago all discounts for quantity business have been in addition to the 1 cent discount allowed at time of delivery on dumps of 100 gallons and over.

On July 1, 1925, for example, the tank wagon customer of the Standard Oil Co. of Indiana, who bought in 100 gallon lots was given a price of 17 cents at time of delivery, a saving of 1 cent as compared with dumps of 1 to 99 gallons. At the end of the month the customer was allowed an additional half cent if he had purchased 750 gallons, three quarters of a cent if he had purchased 2,000 gallons and a full cent if he had bought 3,000 gallons. If he had bought 6,000 gallons his added discount was 1.5 cents or a total of 2.5 cents under the tank wagon or 4.5 cents under the service station price. Discounts were allowed at the end of the year to these contract customers on the basis of monthly average sales in cases where purchases were below the discount level some months, but high enough in a 12 month period to average out the poor months.

A price for 10,000 gallons per month three cents under the base tank wagon was allowed beginning July 28, 1925, and on March 3, 1927, an additional cent a gallon was allowed to buyers of 15,000 gallons or more per month. This last allowance at the present time gives tank wagon customers a price of 12 cents including tax or 10 cents net as compared with a 16 cent base tank wagon, tax paid, or 14 cents net, a total allowance for big gallonage of 6 cents per gallon under the service station price or 4 cents under the base tank wagon.

The accompanying table gives a tabulation of net tank wagon prices at Chicago from Jan. 1, 1924 to date with all published allowances for quantity dumps and Quantity Discount Agreements shown. The tabulation does not attempt to indicate the lowest prices at which tank wagon customers in Chicago are buying gasoline today or have been during the past year when competition has been the most keen. There are known to be a number of private agreements between buyer and seller allowing service station operators margins under the retail price running as high as 7 cents.

CHICAGO TANKWAGON WITH QUANTITY DISCOUNTS IN EFFECT FROM JAN. 1, 1924, TO DATE

1924								
Jan. 1								Any quantity 14 cents
Jan. 12								16
Feb. 5								18
			1 to 99 gals.	100 to 249	250 to 499	500 and Over		
March 6			18	16	15.5	15.25		
				1 to 99 gals.	100 to 199	200 and over		
April 3				18	16	15.25		
					1 to 99 gals	100 and over		
May 23					18	15.25		
July 18					17	15.25		
July 30					16	14.25		
Sept. 12					14	13.00		
1925								
Jan. 1					14	13.00		
Jan. 23					15	14.00		
Jan. 26					16	15.00		
Jan. 31					17	16.00		
Feb. 13					19	18.00		
April 19					18	17.00		
	1 to 99	100 and Over	150 *G.P.M.	2,000 *G.P.M.	3,000 *G.P.M.	6,000 *G.P.M.	10,000 *G.P.M.	15,000 *G.P.M.
July 1	18	17	16.5	16.25	16.00	15.5	....	....
July 14	19	18	17.5	17.25	17	16.5	....	....
July 28	19	18	17.5	17.25	17	16.5	16	....
Aug. 25	17	16	15.5	15.25	15	14.5	14	....
Sept. 1	16	15	14.5	14.25	14	13.5	13	....
1926								
Jan. 1	16	15	14.5	14.25	14	13.5	13	....
Feb. 4	17	16	15.5	15.25	15	14.5	14	....
Apr. 29	18	17	16.5	16.25	16	15.5	15	....
May 17	19	18	17.5	17.25	17	16.5	16	....
Oct. 26	18	17	16.5	16.25	16	15.5	15	....
1927								
Jan. 1	18	17	16.5	16.25	16	15.5	15	....
Jan. 12	17	16	15.5	15.25	15	14.5	14	....
Mar. 1	16	15	14.5	14.25	14	13.5	13	....
Mar. 3	16	15	14.5	14.25	14	13.5	13	12
May 10	14	13	12.5	12.25	12	11.5	11	10

*G.P.M. means gallons per month. Prices in G.P.M. columns are those under Q.D.A. at Chicago only, in general territory discounts are figured from base tank wagon and not quantity dump price.

Work's Committee May Favor Oil Conservation Combines

WASHINGTON, Nov. 28

FACTS known about the nine members of the American Bar Association committee from which are to be taken the three men who are to serve on a committee of nine suggested by Secretary of the Interior Work, indicate the committee will recommend legislation to put oil conservation on an equal footing with railroad consolidation, agriculture, and combination for the exportation of American goods.

Consideration of the known facts inevitably leads to the conclusion that the Work committee will be composed of a majority of men who believe that the federal government can and should have a degree of control over the oil industry if and when there is a tendency to over-develop oil territory. In that respect the committee should be satisfactory to Henry L. Doherty who contends that the government, as a matter of national defense, has plenary power.

The bar association committee will meet Dec. 9 to choose the three to join with an equal number representing the oil industry and three others representing the governmental departments. The meeting of the three-party committtee of nine, called by Secretary Work for Dec. 3, has been postponed to Dec. 10. The meeting was put off one week on account of the meeting of the American Petroleum Institute in Chicago Dec. 6.

"I will name the sub-committee of three to represent the bar association," said Chester I. Long, chairman of the bar association's committee of nine, former senator from Kansas, and former president of the bar association, "but not until after I have consulted with the members of the committee. I will not be one of the three. To serve would take too much of my time but I hope to keep in close touch. It will be a long and hard task the committee has been asked to undertake. Legislation is not obtained in a day or a month or even in a year."

The former senator is a man of long experience in public life. At the time he was talking with the writer he probably had in mind the three members whose qualifications commended themselves to him to such an extent that he thought they should be appointed. But he knew that the political leader, or boss if that word is liked better, who made up slates without consulting any one did not last long or accomplish much.

It is known that the nine men that compose the bar association committee, believe the federal government is hampered in doing what it could for conservation by anti-trust acts of 1890 and 1914.

Railroad consolidation, now thought to be the salvation of the common carrier system of the country, has been held back by the laws forbidding combinations in restraint in trade. In 1920, the law was changed so that if and when the Interstate Commerce Commission believes two or more railroads should be combined, even if thereby competition is materially reduced, that body has the power to permit consolidation.

Prior to 1918 if two or more Americans banded together to export goods they were subject to anti-trust fines. In that year Congress, with a view to fostering combinations for export trade, authorized the Federal Trade Commission to license combinations for that purpose.

Agriculture and horticulture were exempted from the penalties of the anti-trust laws at the time the Clayton anti-trust law was enacted in 1914. Farmers are at liberty to make hard and fast agreements to restrict production and increase prices without danger of punishment. Railroads and exporters are not given the latitude that has been given to farmers and fruit growers.

Nearly all, if not all, the members of the bar association committee believe that if the national government permitted pipe lines and shippers of petroleum and its products to cooperate, when there is a threat of wasteful production of crude, the industry could stop the bringing in of new territory in advance of a plainly indicated need, without aid from the states, because notice that a pipe line or a railroad would not haul crude from a given territory for 30, 60 or 90 days would halt drilling more quickly than anything else.

Hold First Conference on Gas Conservation

SAN FRANCISCO, Nov. 26.—A number of leading oil men of California headed by E. W. Clark, president of the American Petroleum Institute, and executive vice president of the Union Oil Co. of California, met in conference here Nov. 23 with the gas conservation commission named by Gov. C. C. Young for a general exchange of views of the gas wastage situation in California.

This conference was preliminary in character and the various oil company representatives assured the governor's commission of their desire to co-operate in any steps thought necessary and possible to conserve the gas resources of the state. Not all companies of the state were represented. It is thought that the meeting called for Jan. 5 here will be better attended and there will be more business.

After the preliminaries are out of the way, the commission can call on the engineering talent available and a real study of the general situation can be started in proper manner. The appointment of the commission was brought about by the waste of natural gasoline, after it has been stripped of its natural gasoline content, in the Ventura Avenue field. Since the appointment of the governor's commission, the wastage in this field has been reduced about 30,000,000 cubic feet a day. In fact, decision to pinch in these Ventura Avenue wells had been reached before the naming of the commission and the appointment of the body had nothing to do with the action of the oil companies.

The Ventura Avenue field pressure is great and depths of the wells range from 5000 to more than 6000 feet. In pinching in different wells it developed that it would be extremely dangerous to pinch in too much, as the pressure builds up to more than 1000 pounds in some instances. Certain engineers have concluded that if some of the wells were pinched in too much, the well would be killed. These wells cost $100,000 and more.

The thought has been advanced that proper procedure would be to build a pipe line to San Francisco to serve a region where artificial gas now is being used. This means an initial expenditure of some $15,000,000 to $20,000,000. Another view is that at least a portion of waste gas could be piped to nearby badly depleted fields, and pumped into formations to rejuvenate old producers.

Papers delivered at the California Natural Gasoline Manufacturers meeting in Los Angeles appear on pages 27-60-83 of this issue.

P. F. Reardon Dies

HOUSTON, Nov. 26.—P. F. Reardon, 76 years old, who built the first carbon black plant to utilize natural gas at Ludlow, Pa., in 1883, was found dead at his home in Monroe, La., Nov. 25. Burial at Kane, Pa., was set for Nov. 27. Mr. Reardon is survived by his widow and two sons, H. H. Reardon, superintendent, and W. E. Reardon, associated with the Columbian Carbon Co.

Dr. I. C. White Dies; Was Pioneer In Science of Oil Geology

Staff Special

HOUSTON, Nov. 26

DR. I. C. WHITE, state geologist of West Virginia since 1897, who died last Thursday midnight at Johns Hopkins hospital, Baltimore, was internationally recognized as the "father of the anticlinal theory of the accumulation of oil." His death at the age of

DR. I. C. WHITE

79 years ended an active career which included service as chief of the Brazilian coal commission from 1904 to 1908.

Dr. White's industrial interests brought him to the presidency of the Morgantown, W. Va., Brick Co., the Peninsula Co., the Telluric Co., and the West Side Land Co.

He was born in Monongalia county, Va., Nov. 1, 1848, to Michael and Mary A. (Russell) White, and was a descendant of Stephen White, who settled near Baltimore in 1659.

After finishing the common schools, Dr. White received his A. B. and A. M. degrees from the University of West Virginia in 1872, also his LL.D. from the same university in 1920. He received his Ph. D. from the University of Arkansas in 1880, and D. S. from the University of Pittsburgh in 1921.

Dr. White's early service was as an assistant geologist on the second geological survey of Pennsylvania, 1875-1883. He was with the United States Geological Survey, 1884-1888 and served as professor of geology at the University of West Virginia 1877-1893.

The writings of Dr. White included eight volumes of the second geological survey of Pennsylvania, and five volumes of the West Virginia Geological Survey. He edited 25 other volumes. He also wrote bulletin 65 of the U. S. G. S., and a comprehensive coal report on Brazil.

Dr. White took part in civic and political affairs as president of the West Virginia State Board of Trade and as a delegate to the Minneapolis convention at the second nomination of President Harrison. He was a delegate to the International Geological Congress at St. Petersburg (now Leningrad), Russia, in 1897, and the Paris meeting of that organization in 1900.

Scientific organizations of which Dr. White was a member included the Geological Society of America, National Geographic Society, American Association for the Advancement of Science, Washington Academy of Sciences, American Institute of Mining & Metallurgical Engineers, American Association of Petroleum Geologists, Society of Economic Geologists, Association of American State Geologists, and the Geological Society of Washington.

Uses Chart for Flash Point on Blends

CLEVELAND, Nov. 25

A QUICK method of determining in advance the flash point of lubricating oil blends to be made of oils of known flash has been worked out by Louis Hodous, chemist for the Canfield Oil Co. Cleveland. The method has been used with success in the Canfield laboratories for quick calculations for several years.

The accompanying chart used in calculating flash points was prepared by Mr. Hodous after a large number of experimental observations in the laboratory. At the right of the chart is a scale comparing flash and fire points of oils within certain limits. This scale is only approximate and should not be taken as absolutely accurate although it is handy for use in connection with the flash calculation chart.

Curves on the flash chart represent the percentage of low flash oil to be used in the contemplated blend. The horizontal scale represents the difference in degrees Fahr. between the flash point of the oils to be used in the blend. The vertical scale on the left gives the difference in the flash point between the final mixture and the original low flash oil.

For example, assume that it was desired to ascertain the flash point of a mixture to contain 60 per cent of a 500 degrees Fahr. flash oil and 40 per cent of a 360 flash oil. The difference in the flash of the two oils is 140 degrees. The curve representing a 40 per cent mixture of the low flash oil read on the curve showing the proper percentage indicates that the flash point of the final mixture will exceed the flash point of the original low flash oil by 40 degrees. The original low flash oil tested 360 degrees Fahr. so the blend will have a flash point of 400 degrees Fahr.

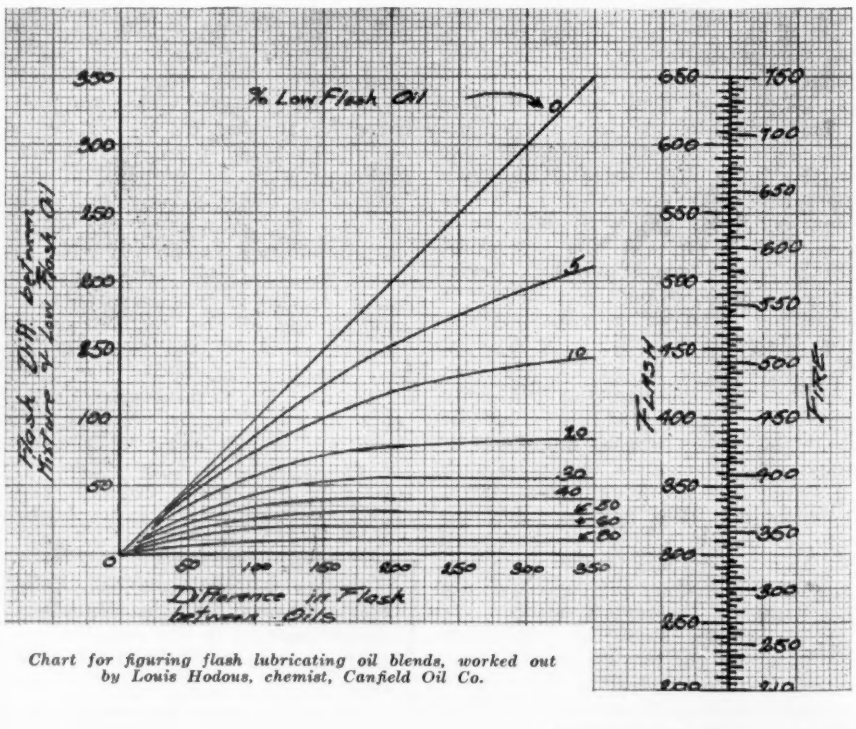


Chart for figuring flash lubricating oil blends, worked out by Louis Hodous, chemist, Canfield Oil Co.

Trade Bureau Proclaims Policy Of Helpfulness to Business

Staff Special
WASHINGTON, Nov. 28

PROCLAMATION that it has changed its ways is contained in the introduction to the Federal Trade Commission's thirteenth annual report made public today. The report also contains a recital of the work that has been done in the past year on the inquiry into the prices of petroleum and its products ordered by the Senate on June 3, 1926, and an investigation into prices of crude in the Panhandle field of Texas.

The report about the Panhandle field seems to exempt the purchasers who posted flat prices per barrel instead of the gravity price basis, from any censure for what they did and to say that the small producers who charged discrimination, made their charges without sufficient grounds.

"New conceptions of the part the Federal Trade Commission occupies in the commercial life of the nation have come into practice recently, and in the fiscal year that closed June 30, 1927, they resulted in far-reaching development," says the report. "The newer policies have to do principally with the idea of self-regulation in business and industry, and it has been possible to progress in these directions without overstepping the bounds of the commission's powers as laid down by law. 'Helping business help itself' wherever and whenever it can be done consistently without prejudice to the best interests of the public as a whole is the principle of this policy."

There was no intimation as to what the commission will report concerning the price of petroleum and its products, particularly gasoline. The commission listed a great amount of detail work it had done in the investigation even delving into the stock ownership of large Independent and Standard companies.

Concerning the Panhandle situation, the commission reported:

"As a result of careful investigation among large and small operating companies, whose combined production comprised more than 70 per cent of the current output of the Panhandle field, it was found that prior to the latter part of July, 1926, the oil was purchased upon a gravity basis. Crude oil testing 28 to 28.9 degrees gravity brought $1.35 per barrel, with an adidtion of 5 cents for each full degree in gravity up to 39 degrees gravity and above, for which the maximum price was $1.90 per barrel. This schedule of prices applied to the field in general. Following the action of a minor purchasing company which, on August 1, 1926, abandoned the gravity price system, substituting therefor a flat price of $1.25 per barrel for crude petroleum produced in Hutchinson and Carson Counties, two of the major purchasing companies on September 22 and 24 posted a flat price of $1.25 per barrel for crude oil produced in Hutchinson and Carson Counties. A similar course was adopted October 4 by the remaining purchasing company. This brought the matter to an issue. At that time the daily production in Hutchinson and Carson Counties was around 120,000 barrels, which was equivalent to 95 per cent of the total output for the Panhandle field.

"On one hand, particularly among the smaller producers, there was a strong belief that they were being imposed upon, and allegations of discrimination as compared with prices paid for Oklahoma and north and central Texas crude petroleum were made. On the other hand, the purchasing companies declared that the Panhandle crude was abnormally high in paraffin and sulphur content, thus making it more difficult to handle in pipe lines and in refinery operations, and because of these unusual characteristics there was no demand for the oil among refiners. Furthermore, what was deemed highly objectionable was the fact that the producers were pushing drilling operations and increasing the production at a time when pipe-line and storage facilities were inadequate to handle the output.

"After thorough investigation of the situation it was found that only a few of the smaller producers had taken the precaution to erect storage tanks to care for the new production, and drilling operations had increased the output to a point far in excess of the pipe-line and storage facilities of the few purchasing companies that were attempting to handle the oil. Prorating the quantity of oil taken from each producer was resorted to, and this afforded some relief to the smaller producers. The general congestion in the field was further relieved by curtailing drilling operations.

"There were ample railroad facilities for shipping the oil to distant points, but there was an obvious shortage in field storage tanks and in gathering pipe lines to move the oil from the wells to railroad loading racks. The larger and more experienced producing companies erected tanks and installed gathering lines to handle their own production, and they also gave all possible assistance to neighboring smaller producers, but the greatest difficulty was in providing adequate facilities to accommodate all those that desired an immediate market and constant service in moving the oil from the wells.

"As regards the reasons for reducing the price of the product, inquiry among the few refineries that had experience in refining Hutchinson County oil developed the opinion that because of its peculiar character it was more difficult to handle and more expensive to refine than crude produced in other fields."

Gulf and Texas Co.'s Pool Patents

(*Continued from Page* 18)

power during the entire stroke of the piston whereas the distillate gives off its power during only a fraction of the stroke. The observations of Hall have been confirmed by the experience of others.

"Therefore there is reason to believe that instead of being inferior the cracked gasoline is really superior for use in automobile engines as regards both mileage and power obtainable, even though they lack some desirable properties and this suggests that a blend of cracked gasolines and the straight distillate gasolines may give a greatly improved result."

This seems to show that some technologists even 11 years ago realized, perhaps dimly, the theory of eliminating detonation and loss of power by slowing up the burning mixture in the cylinders which is now almost universally accepted and which has led to the development of tetraethyl lead and vapor phase cracking, as well as setting operating and research men to work to get better results from an anti-knock standpoint from the generally used liquid phase cracking processes.

Bit Strays 660 Feet

TULSA.—The old favorite—a hole so far out of plumb as to hit another—comes to light in the Little River pool of Seminole county and is properly authenticated. Magnolia Petroleum Co.'s No. 4 Pottey, in the NE SE NE of 35-8-6, when 829 feet deep—or sidewise—ran into the Carter Oil Co.'s well in the NW SW NW of 36-8-6, then 2193 feet deep. On the surface the wells were 660 feet apart.

Skelly Officials on Western Tour

CHICAGO, Nov. 26.—Officials of the Skelly Oil Co. have just completed a 10-day tour of their western marketing territory in Iowa, Nebraska and Minnesota. The party traveled by automobile. It consisted of W. G. Skelly, president; C. C. Herndon and F. A. Pielsticker, vice presidents; F. T. Hopp, secretary-treasurer; G. A. R. Slocum, sales manager; W. T. Atkins, manager of the station department, and Glen Condon, director of public relations.

Cargo of Natural Gasoline is Sold By Chestnut & Smith Corp.

TULSA, Nov. 28

THE Chestnut & Smith Corp. has sold a cargo of natural gasoline to a European buyer, it was announced this week by D. E. Buchanan, vice president. The gasoline will be picked up from a New Orleans terminal about Dec. 15 by a tanker destined for the continent.

The gasoline will be the new export grade of "Naturaline" the trade marked superstabilized gasoline which was developed by Chestnut & Smith earlier in the year. It is a product similar to that which is being offered by the company for airplane use in this country. The gasoline will not be blended with any refinery gasoline for shipment.

The sale is looked on as being of great importance by the natural gasoline industry since it represents the first sale by an Independent manufacturer in this country direct to the export trade. For more than a year the Dutch Shell interests have been buying gasoline in the Mid-Continent which was stabilized at the terminals of the New Orleans Refining Co. and shipped abroad. The Standard Oil Co. of New Jersey and some other interests also have been moving natural gasoline in the coastwise trade from Gulf to Atlantic ports for some time.

Manufacturers of natural gasoline are convinced that there is an important market for their product in Great Britain and on the continent of Europe where most of the automobiles have a higher compression ratio than most of those now used in the United States. Most motor fuels sold in Europe are more volatile than the average gasoline now marketed in the United States.

Advances in manufacturing practice at gasoline plants in the Mid-Continent during the past year have provided for the production of natural gasoline and do their own blending to be shipped in cargo lots without blending. Large overseas consumers, as a result, may now buy their natural gasoline and do their own blending with heavier gasolines produced by their own refineries or other imported gasoline.

Last summer Mr. Buchanan made a trip to Europe to survey the market. He is understood to have taken a number of samples of Naturaline with him at that time to be tested by prospective customers.

Coming Meetings

American Petroleum Institute, Hotel Stevens, Chicago, Dec. 6, 7, 8.

Montana Chapter, Rocky Mountain Oil & Gas Association, Great Falls, Mont., Dec. 9, 10.

Nebraska Independent Oil Men's Association, Hotel Fontenelle, Omaha, Neb., Dec. 14, 15.

Michigan Independent Oil Men's Association, Statler Hotel, Detroit, Feb. 2, 3.

Ohio Petroleum Marketers Association Spring Convention and Exhibit Exposition, Neil House, Columbus, O., Feb. 22, 23, 24.

American Oil Men's Association, Hotel Stevens, Chicago, March 6, 7 and 8.

American Oil Burner Association, Hotel Stevens, Chicago, April 3, 4, 5, 1928.

Operators Discuss Causes Of Inaccuracies

Staff Special by Telegraph

BRECKENRIDGE, Tex., Nov. 29.—Factors tending to cause inaccuracies in the measurement of gas created a lively discussion at the natural gasoline plant operators meeting here today under auspices of the Natural Gasoline Association of America for operators of plants in the Breckenridge district. The meeting opened with nearly 200 men present representing most of the 32 plants in this county and many from adjacent counties.

D. A. Sillers, of the Lone Star Gas Co. led the discussion on gas measurement. He recommended that all companies build a closer relationship between field men such as meter inspectors and chart readers in the office. He told how lack of close touch has resulted in huge measurement errors through changes in orifice plates without changes in office records and methods his company has used to eliminate this. He announced that work of committees of the gasoline and gas associations is progressing rapidly in the study of the following factors in gas measurement one proper set up of orifice meters two surging flow three effect of changes in density on coefficients and four proper selections and use of regulators. He stated also that the Independent investigations of the American Gas Association on the measurement of artificial gas the Natural Gas Association on natural gas and the bureau of standards on air are being correlated to produce a final single set of coefficients.

Dr. E. R. Lederer, vice president of the Texas Pacific Coal and Oil Co., was chairman of the meeting. The first speaker was John O'Connor, of the Gas Engineering and Construction Co., who stressed the fact that the little things which are neglected in engine operation are those which cause serious losses of time and big repairs. He explained the operation of the recently patented Hubbell injector for two cycle engines for giving gas engines a diesel engine cycle and increasing fuel efficiency.

F. B. Good, chemist of the Texas Co., read a paper on water treatment. O. F. Kluenter told of the benefits of air filters on gas engines and compressors.

At the afternoon session papers were to be read by C. L. Hightower and F. R. Staley, of the Texas Pacific Coal and Oil Co.; C. M. Edwards, of Chestnut and Smith Co., and T. G. Laney, of the Smith Separator Company.

Treasurer of Prairie Dies in Independence

Staff Telegram

TULSA, Nov. 29.—Funeral services for E. T. Patterson, treasurer and a director of the Prairie Oil & Gas Co., who died Sunday at his home in Independence, Kan., will be held Friday afternoon at 3 o'clock.

Mr. Patterson, who was 62 years old, had been in poor health for several years. He had been in the Prairie organization for 27 years, having come into the company from the old Forest Oil Co., which was consolidated with Prairie. He is survived by his widow, two daughters and four sisters.

Lincoln Jobber Passes Away

LINCOLN, Neb., Nov. 26.—D. H. Merritt, an oil jobber of Lincoln, died at Fairbury, Neb., on the afternoon of Nov. 12. He was on his way from Lincoln to his ranch near Reynolds, Neb., when he was stricken with a heart attack and the end came suddenly. His two oldest sons will carry on Mr. Merritt's business under the name of the D. H. Merritt Estate.

The Effect of Barometric Pressure On Orifice Meter Measurement

By B. M. Laulhere
and W. M. Young*

IN ORIFICE meter measurement, two absolute pressures must be definitely established. The first is the absolute base pressure, to be used in establishing the unit of measurement, and the other is the absolute pressure of the gas in the meter.

The first is an arbitrary pressure, the second an actual one. The base pressure may or may not be selected with reference to the barometric pressure at the point of measurement. However, to obtain accurate volumes the average barometric pressure at the point of measurement must be known, in order to establish the absolute pressure of the flowing gas.

The unit of gas measurement is referred to an absolute pressure base, which is usually designated in pounds per square inch. This absolute pressure base is usually fixed as a certain number of ounces above the average barometric pressure at the point of measurement.

Until recently, it has been standard practice to consider the average barometric pressure as 14.4 pounds per square inch; which is due to the fact that this value is representative of the average barometric pressure of most of the gas fields in the United States. To this barometric pressure, a pressure base usually expressed in ounces was added, to arrive at the absolute pressure base to be used in establishing the unit of measurement.

In recent years, however, gas fields have been developed where the average barometric pressure varied both above and below 14.4 pounds per square inch, in fact, ranging from about 11.9 pounds per square inch to 14.7 pounds per square inch. With the development of gas in these fields, it became customary to use the average barometric pressure in these localities, plus a certain number of ounces (usually 4 ounces) as the absolute pressure base to be used in determining the unit of measurement.

The unit of measurement established in this manner varies with the barometric pressure at the point of measurement, and the results obtained are comparable only with measurements made at localities having the same barometric pressures.

For example, assume a pipe line where the average barometric pressure at one end is 14.4 pounds per square inch, and at the other end

Presented at meeting of California Natural Gasoline Association, Los Angeles, Nov. 15. Prepared in conjunction with the metering committee of the association.

11.4 pounds per square inch. At both ends a pressure base of 4 ounces is used, giving absolute pressure bases of 14.65 and 11.65 pounds per square inch respectively, at the lower and upper ends of the line.

Using these values in the coefficients, for measuring at each end of the line, will obviously give different volumes. A coefficient calculated on an absolute pressure base of 11.65 pounds per square inch at the upper end of the line, results in a volume approximately 20 per cent greater than the measurement obtained by using an absolute pressure base of 14.65 pounds per square inch at the lower end of the line.

IT IS evident that if more gas is measured out of the line than is measured into it, the units of measurement must be different. In other words, the cubic foot used to measure the gas in is different from the cubic foot used to measure the gas out; hence the results obtained when different absolute pressure bases are used are not comparable.

It is readily seen, that if the average barometric pressure is used in calculating coefficients for meters at different elevations, it is impossible to compute pipe line losses without making corrections for these differences. This fact also holds true when calculating plant efficiencies. In some districts of southern California, as many as three units of measurement are in use in the same field, these are based on absolute pressures ranging from 14.65 pounds per square inch to 14.9 pounds per square inch.

In fact, they are in use on the gathering system of one compressor station. The maximum error, or rather the difference due to the use of the various units of measurement, in this case is 1.7 per cent. This leads to many difficulties, not only in arriving at losses on pipe line systems and through plants, but also in gas accounting which is becoming more and more complicated.

Since the weight of a unit volume of gas does not change, and neither does its heat content, it is apparent that through the use of different units of measurement, the unit volume will change and the heat content per unit volume will be different. Therefore, in making comparisons between gas and other fuels, it is necessary to know the absolute pressure base used in establishing the unit of measurement. The importance of this, when making comparisons with other fuels, is best illustrated by an example:

A gas measured, using an absolute pressure of 14.73 pounds per square inch and 60 degrees Fahr. temperature, to establish the unit of measurement, contained 960 B.t.u. per cubic foot. The same gas measured, using an absolute pressure of 12.28 pounds per square inch and 60 degrees Fahr. temperature, to establish the unit of measurement, will contain 800 B.t.u. per cubic foot.

Assuming a barrel of oil to contain 4,800,000 B.t.u., this would be equivalent to 6,000 cubic feet of gas, measured at an absolute pressure base of 12.28 pounds per square inch, and 5,000 cubic feet of gas measured at an absolute pressure base of 14.73 pounds per square inch. It is evident that in making comparisons between gas and other fuels that proper thought must be given to the unit of measurement, to which the gas is referred; since the heat content of liquid fuel is the same at any altitude.

IN establishing the unit of measurement, in this case the cubic foot, two conditions must be known. The first is the base temperature, to which our standard cubic foot is to be referred, and the second is the absolute pressure, to which this unit of measurement is to be referred. Regarding the first condition, the accepted base temperature, with very few exceptions, is 60 degrees Fahr.

In all gas measurement work, great care has always been taken to refer the flowing temperature to the standard base temperature, by making the necessary connections. Regarding the second, there seems to have been a

*Southern California Gas Co.

great deal of confusion or misunderstanding, as to how the barometric pressure affected orifice meter measurement.

There has apparently been a misunderstanding, that in order to make volumes comparable, the coefficients should be corrected for changes in barometric pressures.

Since all gas measurements are referred to as 60 degrees Fahr. (520 degrees Abs.) temperature, irrespective of the atmospheric temperature at the point of measurement, it does not seem logical to change the absolute pressure base to conform to barometric pressures at the point of measurement.

It is time that a standard absolute pressure base should be adopted for use in establishing the unit of measurement, and eliminate many of the misunderstandings that have existed up to the present time. The accepted pressure standard now used in gas testing work is 30 inches of mercury (14.73 pounds per square inch) and 60 degrees Fahr. temperature. This standard is also used for the measurement of manufactured gas.

There seems to be no reason why a different standard should be used for the measurement of natural gas, and the following resolution was adopted by the Pacific Coast Gas Association at its annual convention at Santa Cruz last September:

WHEREAS: The present practice in the natural gas industry of basing gas measurements by means of orifice meter on the barometric pressure at the point of measurement tends to reduce in accuracy and complicate orifice meter measurement, and,

Whereas: It would be desirable to have a uniform pressure datum for gas measurement throughout the gas industry, and,

Whereas: A pressure datum of 14.73 pounds per square inch has been established and is universally used in the manufactured gas industry and in testing work, be it therefore resolved: That in orifice meter work a standard pressure of 14.733 pounds be recommended for use by all member companies and their associates in the natural gas industry.

Effect of Barometric Pressure on Pressure Extensions

THE barometric pressure, however, does have an important bearing on the measurement of gas, but only after the unit of measurement has been established.

The formula used for calculating the flow of gas through an orifice meter is:

$Q=C\sqrt{Ph}$

in which

Q=The quantity of gas passing the orifice in cubic feet per hour.

C=A coefficient, depending on the specific gravity of the gas, its temperature, size of pipe, size of orifice, location of pressure connections, etc.

P=Absolute pressure of the flowing gas.

h=Drop in pressure across the orifice in inches of water.

The absolute pressure, P, is the sum of the gauge pressure, and the barometric pressure at the point of measurement.

The present pressure extension tables are based on a barometric pressure of 14.4 pounds per square inch; therefore, in order to obtain correct results, a correction must be applied to the volumes calculated, when using these tables, if the barometric pressure at the point of measurement is other than 14.4 pounds per square inch.

This error becomes greater as the difference between the barometric pressure at the point of measurement and 14.4 increases; but it decreases rapidly as the pressure increases. However, when measuring gas at very low gauge pressures or at a partial vacuum, the error is considerable.

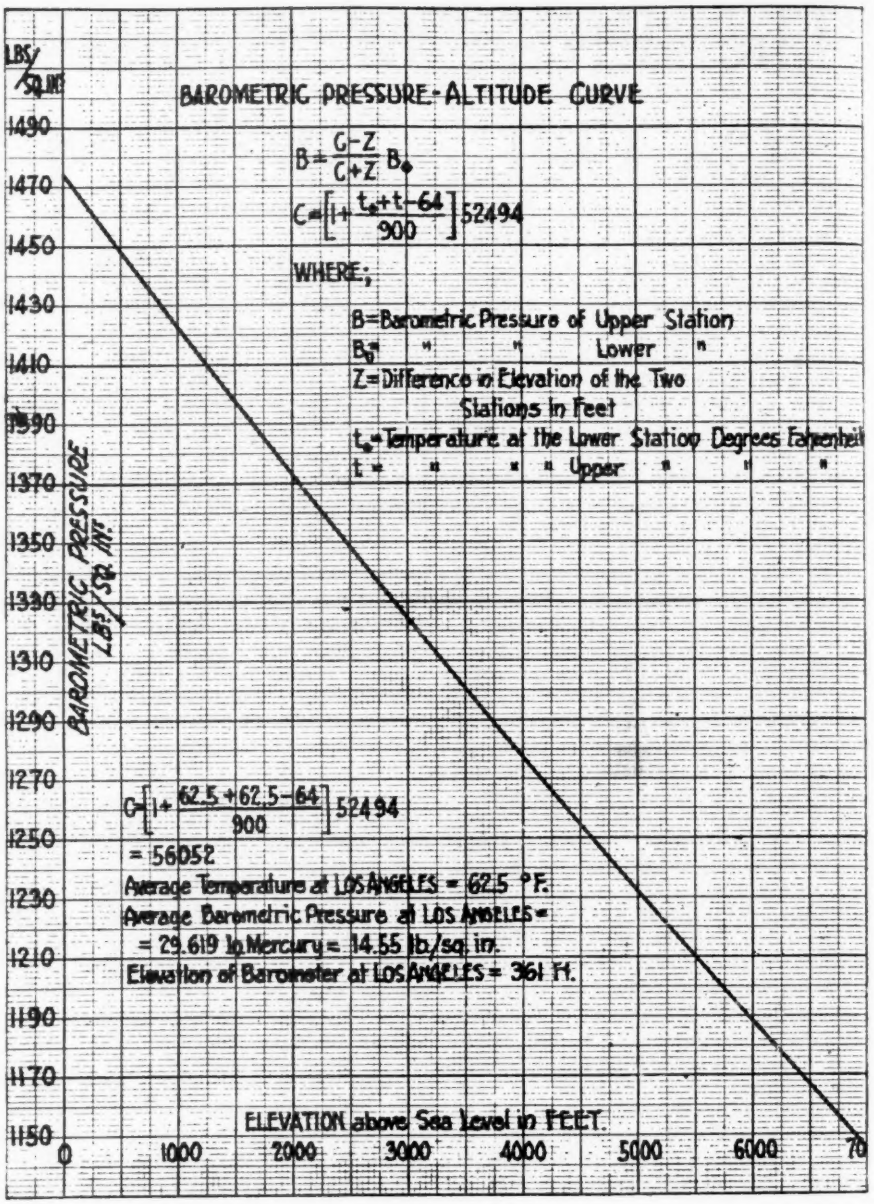


Chart plotted to facilitate calculating orifice meter data

The following tables show the error when measuring gas at various pressures, and different barometric pressures, at the point of measurement when the volumes have been calculated using pressure extensions based on a barometric pressure of 14.4 pounds per square inch.

Barometric pressure at point of measurement = 14.73 pounds/D" Pressure	Error per cent
20" Vacuum	3.5 low
10" Vacuum	1.6 low
0-pound Gauge	1.15 low
5-pound Gauge	.85 low
25-pound Gauge	.4 low
50-pound Gauge	.25 low
100-pound Gauge	.15 low

Barometric pressure at point of measurement = 14 pounds/D" Pressure	Error per cent
20" Vacuum	4.45 high
10" Vacuum	1.9 high
0-pound Gauge	1.4 high
5-pound Gauge	1.05 high

25-pound Gauge	0.5	high
50-pound Gauge	0.3	high
100-pound Gauge	0.15	high

Barometric pressure at point of measurement = 12 pounds/D″

Pressure	Error Per cent	
20″ Vacuum	30.9	high
10″ Vacuum	14.1	high
0-pound Gauge	8.7	high
5-pound Gauge	6.4	high
25-pound Gauge	3.0	high
50-pound Gauge	1.9	high
100-pound Gauge	1.1	high

Barometric Pressure at point of measurement = 14.6 pounds/D″

Pressure	Error per cent	
20″ Vacuum	2.2	low
10″ Vacuum	1.0	low
0-pound Gauge	0.7	low
5-pound Gauge	0.5	low
25-pound Gauge	0.25	low
50-pound Gauge	0.2	low
100-pound Gauge	0.1	low

Barometric pressure at point of measurement = 13 pounds/D″

Pressure	Error per cent	
20″ Vacuum	16.3	high
10″ Vacuum	6.9	high
0-pound Gauge	5.0	high
5-pound Gauge	3.7	high
25-pound Gauge	1.8	high
50-pound Gauge	1.1	high
100-pound Gauge	0.60	high

It is apparent that the error caused by the use of these tables, at elevations where the barometric pressure is other than 14.4 pounds per square inch, is of great importance since it is not compensating.

If the barometric pressure at the point of measurement is greater than 14.4 pounds per square inch, the volume resulting from the use of pressure extension tables based on 14.4 pounds is less than the true volume, and greater than the true volume if the barometric pressure at the point of measurement is less than 14.4 pounds.

The correction to apply to the volume, obtained by the use of pressure extension tables, in order to correct for the actual barometric pressure at the point of measurement is:

Multiplier=

$$\frac{\text{Gauge Press. + Baro. at point of measurement}}{\text{GAUGE PRESS.+14.4}}$$

A METHOD of making this correction that saves any calculation, and also permits of the use of the present pressure extension tables, is to make the necessary adjustment to the gauge. If the barometric pressure is below 14.4 pounds, set the static pressure pen, a space below the zero line on the chart equal to the difference between the barometric pressure and 14.4 pounds. If the barometric pressure at the point of measurement is greater than 14.4 pounds, set the pressure pen above zero a space equal to the difference between the barometric pressure and 14.4 pounds.

For example: when the barometric pressure is 12.2 pounds per square inch, set the static pen 2 pounds below zero, when the gauge is open to the atmosphere. When a pressure is applied until the gauge shows a pressure of 20 pounds, the absolute pressure is (20+2)+ 12.4=34.4 pounds. By making this adjustment to the static pressure pen, a static pressure is recorded that corresponds to the absolute pressure used in calculating the pressure extension tables now in use and based on a barometric pressure of 14.4 pounds. Consequently, if the static pressure pen is adjusted to make the necessary allowance between the barometric pressure at the point of measurement and 14.4 pounds per square inch as suggested, the pressure extension tables may be used with no other correction to obtain correct volumes.

This method of making corrections for the barometric pressure is satisfactory where measurements are made under pressure; but in cases such as the measurements from heading wells, where during part of the time the gas is under a pressure and part of the time under a partial vacuum, it it not to be recommended. It has been tried on compound springs, but the results have not been satisfactory.

DUE to a wide range of the static pressure variations, or other reasons, it might not be advisable to use either of the above methods of making corrections. In such cases, a method of calculating volumes with a slide rule may be resorted to. A slide rule has been devised that can be obtained in graduations suited to any barometric pressure and the volumes obtained with this rule are correct for the particular barometric pressure for which it has been calibrated, no further corrections being necessary.

The committee has given considerable thought to the making of changes in barometric pressures for use under the radical, and make the following recommendations for establishing the average barometric pressure:

First: That the average barometric pressure, for use under the radical, be changed for each 250 feet in elevation.

Second: That the average barometric pressure to be used under the radical, be the average barometric pressure of the point midway between the 250-foot stations.

For example: The average barometric pressure at an elevation of 125 feet would be the barometric pressure for use under the radical, for all meters between sea level and an elevation of 250 feet, and the average barometric pressure at an elevation of 375 feet would be the barometric pressure for use between 250 feet elevation and 500 feet elevation.

Using this suggested method, the greatest error would only be that due to the difference in absolute pressures, as they would be affected by a difference in elevation of 125 feet. Except in cases of very high vacuum this is negligible. At 20 inches of vacuum this amounts to 0.7 per cent at sea level, and 1 per cent at 4,000 feet elevation. At atmospheric pressure, the maximum error is 0.2 per cent for the same range of elevations.

It is obvious that difficulties may be encountered in arriving at the average barometric pressures to use under the radical at various elevations. Due to monthly and seasonal changes, it would be impractical to take a barometer to the meter station to determine the barometric pressure. Even an average of readings, extending over a short period of time, would be unsatisfactory.

F. A. HOUGH, in a paper presented before the Pacific Coast Gas Association, September, 1927, suggested a method of determining the average barometric pressure, for use in connection with orifice meter measurement. It is entirely practical, and if adopted, would eliminate all of the difficulties encountered in arriving at the absolute pressure.

The method suggested by Mr. Hough follows:

"To facilitate the using of true absolute pressures in calculating orifice meter data, the chart shown has been plotted. This chart gives values for the barometric pressure at elevations ranging from sea level to 7,000 feet, and is applicable, the committee believes, to all points in southern California where orifice meters are used. The data for this chart was obtained as follows: From the United States Weather Bureau in Los Angeles, the average barometric pressure for the period from 1878 to 1924 was obtained, as well as the average temperature for the same period. The assumption was then made that the average temperature at all other points in southern California is the same as that of Los Angeles (a rather large deviation from this assumption would cause a negligible error in the barometric pressure reported) and that the average barometric pressure for all points in southern California differs from that of Los Angeles only because of difference in elevation. The elevation of the weather bureau was obtained and the barometric pressure for a series of elevations was calculated by means of the following formulae taken from Smithsonian Physical Tables, 7th Revised Edition, page 145

$$Z = C\ (Bo - B) \div (Bo + B)$$

$$C \text{ (in feet)} = 52494\ (1 + to + t - 64) \div (900)$$

in which Z = Difference in height of two stations in feet.

Bo = Barometric pressure at lower station in inches of mercury.

B = Barometric pressure at upper station in inches of mercury.

to = Temperature at the lower station in degrees Fahr.

t = Temperature at the upper station in degrees Fahr.

Sample Calculation:

Average barometric pressure at Los Angeles = 29.619 inches mercury.

Average temperature at Los Angeles = 62.5 degrees Fahr.

Elevation of barometer at Los Angeles = 361 feet.

Elevation of upper station = 600 feet.

Average temperature at upper station = 62.5 degrees Fahr.

C = 52494 (1+62.5+62.5—64) ÷ (900) = 56052

Transposing the equation Z = C (Bo—B) ÷ (Bo+B) we find that B = (C—Z) ÷ (C+Z) Bo

B = 56052 — (600—361) x 29.619 ÷ 56052+(600—361)

B = 29.368 inches of mercury = 14.42 pounds per sq. inch.

To determine the average barometric pressure at any meter station, it is only necessary to look up the elevation of the meter on a contour map and then read from the chart the barometric pressure corresponding to the elevation of the station. This procedure will doubtless give a value nearer to the average barometric pressure than could be determined by a few observations at the meter by means of an aneroid barometer, and the labor involved is less. If a chart, such as this one, could be generally accepted as standard, disagreement among various companies as to the average barometric pressure at any given point, could be eliminated. A useful figure disclosed by this chart is that a difference of 100 feet causes a difference in barometric pressure of approximately .05 pound per square inch of .1 inch of mercury.

Gives Directions for Making Petrolatum from Rod Wax

CLEVELAND, Nov. 25.

FORREST A. HOFF, expert on grease making, has written the following directions to a customer who inquired how to make petrolatum from rod wax:

"Starting with rod wax or the settlings from settled stock, add enough wax distillate or neutral oil to bring the mixture down to the proper melting point. The mixture is then placed in a still and run down to about 113 melting point, the distillation of the stock sweetening it without any further sweetening process.

"If the stock and neutral are simply mixed without running a distillation, the compound must be placed in an open tank and steamed with steam until sweet. Another process of sweetening is to mix 25 deg. ammonia with the compound.

"After the mixing and distillation process is completed, the product is pumped hot to the filter house where it is filtered to the desired color. The colors run Red Vet, Amber, Pale Yellow, Cream Lily and Snow. Different refineries have different ways of running their goods, some run by cuts, that is, when the crude petrolatum is pumped into the filter the lightest is run into No. 1 pan, the next color into No. 2 pan and so on down until the filter will no longer produce or cut the stock.

"However, it has been clearly demonstrated that as great a quantity cannot be produced up to any desired color by cuts as can be produced by using the following method: To produce snow, use lily; to produce lily, use cream; and so on down.

"In soaking up a filter, pump into the filter about 25 barrels of goods and after that is well soaked in, pump on about 25 barrels more. After the second 25 barrels are soaked in, pump on another 25 barrels. Wait about five minutes between each pumping and pump on very slowly so as to soak the filter from the center out. It is always advisable to place a splash board on top of the earth for the oil to fall upon, so that the falling liquid will not make a hole in the earth. When starting the filter, be sure there are no bubbles coming up through it. Bubbles indicate air in the filter. The stream running from the filter should not carry over five pounds per minute.

Fullers' Earth For Filtering

"GREAT care should be exercised in burning fullers earth. It should not be burned too hard. Over-burning destroys the filtering power of the earth and will cause it to break into small sizes.

"The formation of a crust on the outside of the earth shows that the earth is not properly dried. The formation of such a crust prevents the heat from extending all through the mass, and the pores in the body of the mass are completely closed. If the pores are closed, the oil cannot percolate through the earth and therefore no change will take place in the color of the goods you are running. The object of filtering is to remove color-bearing material and free carbon.

The table which follows was obtained from timing and gauging a 7-foot by 14-foot filter:

Record of Filtering

Started loading filter	Jan. 1 at 10 a.m.
Finished loading filter	Jan. 3 at 5:30 a.m.
Earth used	No. 2 and 3, 200 cans
Started soaking	Jan. 3 at 8:15 a.m.
Finished soaking	Jan. 5 at 10:00 a.m.
Stock soaked	No. 2 Amber 2944 Gals.
Followed with	Red Vet 3960 Gals.
Followed with	No. Red Vt. 4930 Gals.
Followed with crude petroleum	Crude Pet. 2985 Gals.
Total	14,819 Gals.
Yield	Amber 2772 Gals.
Yield	No. 2 Amber 2944 Gals.
Yield	Red Vet. 3980 Gals.
Yield	No. 2 Red Vet. 4502 Gals.
Total	14,198 Gals.
Soaked up and remaining in earth	621 Gals.
Started draining	Jan. 11 at 11:00 a.m.
Finished draining	Jan. 13 at 6:50 a.m.
Started washing, 1st wash	Jan. 13 at 6:55 a.m.
Finished washing, 1st wash	Jan. 13 at 11:00 a.m.
Stock used, washing 1st wash	Grade 2—1600 Gals.
Started washing, 2d wash	Jan. 13 at 11:15 a.m.
Finished washing, 2d wash	Jan. 13 at 12:24 p.m.
Stock used, washing 2d wash	Grade 52 Naphtha, 2000 Gals.
Started steaming filter	Jan. 13 at 5:00 p.m.
Finished steaming filter	Jan. 14 at 10:00 a.m.
Started dumping filter	Jan. 15 at 9:00 a.m.
Finished dumping filter	Jan. 16 at 9:00 a.m.
Started refilling filter	Jan. 16 at 10:15 a.m.

Texas Well Spacing Rule Held Valid on Appeal

Staff Special

HOUSTON, Nov. 26.—The Supreme Court of the United States must determine the validity of rule 37 of the Railroad Commission of Texas, which says that an oil well, except in the Gulf Coastal region, may not be drilled closer than 150 feet from an adjacent property line or nearer than 300 feet to another well on the same lease.

Appeal to the nation's highest tribunal will follow a decision of the U. S. Circuit Court of Appeals at New Orleans, where a damage suit had been taken by the Oxford Oil Co., and others, against Atlantic Oil Producing Co. and others, after earlier hearings in state courts.

The circuit court of appeals upheld the validity of rule 37 and rejected claims for $8,000,000 asked by the Oxford Oil Co. and J. G. Bass of Houston. Litigation was an outgrowth of East Texas fault-line field development, where it was alleged enforcement of the Texas spacing regulations permitted lessors on adjoining tracts to recover oil from small parcels of land owned by the Oxford company and Bass.

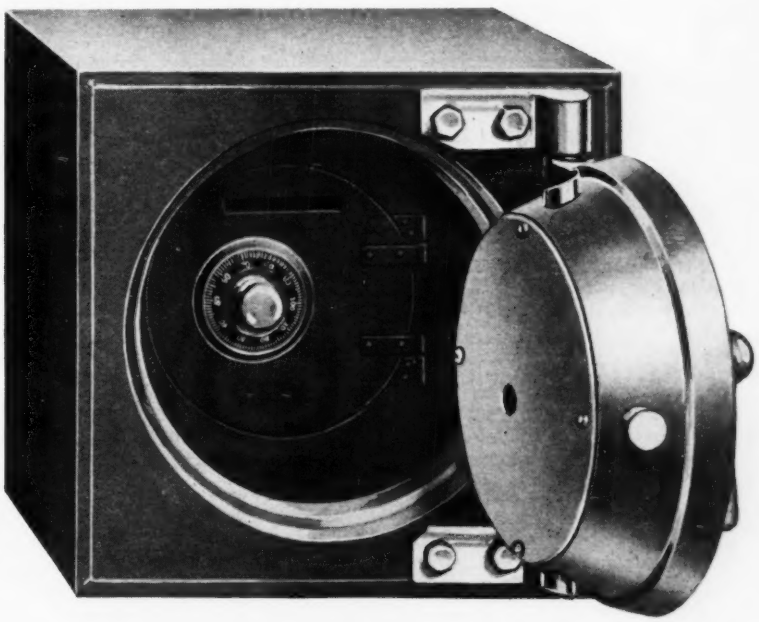
Defendants with the Atlantic company were S. E. Gilmore, W. A. Nabors, W. M. W. Splawn, members of the railroad commission at the time the rule was enforced; R. B. Walthal, oil and gas supervisor for the commission at that time and C. O. Rison, then deputy supervisor.

Court Decides on Florida Rate Case

WASHINGTON, D. C., Nov. 28.—The Supreme Court of the United States today decided in two cases, the Atlantic Coast Line vs. Standard Oil Co. of Kentucky and the Standard of Kentucky vs. Atlantic Coast Line, that petroleum and its products brought into Port Tampa and Jacksonville, Fla., by tank steamer are entitled to the Florida state rates when they are shipped out to points in Florida. It reversed decisions of the lower Florida courts.

Diebold Two Door Burglarproof Chest For Oil Stations. Takes Class "E" Mercantile Burglary Insurance Rating.

Money Talks— so does a GUN



With a gun pointed at his midriff, it is a very foolish attendant who won't tell the combination of the safe to the enterprising bandit who demands it. Or, in fact, who won't open the safe door as quickly and quietly as shaky fingers will permit?

But the attendant doesn't know the combination of the *inside* door on Diebold Burglar Proof Chests. And the thug behind the gun *knows* he doesn't know.

Only two-door chests give adequate protection to oil station funds. The outer compartment is for small bills and silver. The inner compartment protects the day's or week's receipts and that can only be opened by the authorized collector in company with the station attendant.

Does this sort of protection for your funds appeal to you? It has the added advantage of protecting men's lives, for bandits know about this two-door chest and respect it.

THE DIEBOLD SAFE & LOCK CO.

Canton, Ohio

DIEBOLD SAFES

Compilation Of Mid-Continent Refinery Operations

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Mid-Continent Refinery Operations Week Ended November 25 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	North La.-Ark.	Total Week Ended Nov. 25	Total Week Ended Oct. 28
Plants Reporting	12	28	27	12	79	79
Crude Capacity (bbls.)	92,000	157,200	104,500	54,900	408,600	408,700
Cracking Capacity	30,700	52,600	16,200	22,700	122,200	122,200
Da. Av. Crude Runs	53,548 — 1.8	105,425 + 2.0	63,321 — 3.6	39,011 + 1.7	261,305 — 0.2	265,651
Da. Av. Other Oils	7,413 + 9.4	4,985	8,261 + 29.3	1,148 — 27.7	11,837 — 23.1	17,152
GASOLINE—Gallons						
Stocks, Nov. 18	9,416,000	31,755,000	17,654,000	4,553,000	63,423,000	63,810,000
Prod. 11-18 to 11-25	8,606,000 + 1.4	14,759,000 — 13.6	7,959,000 — 10.3	3,406,000 — 3.4	34,730,000 — 8.5	37,204,000
Ship. 11-18 to 11-25	7,801,000 + 1.5	12,385,000 — 20.4	7,603,000 — 15.4	3,663,000 — 4.2	31,452,000 — 12.7	37,472,000
Stocks, Nov. 25	10,266,000 + 8.5	34,129,000 + 7.5	18,010,000 + 2.0	4,296,000 — 5.6	66,701,000 + 5.2	63,542,000
Ratio Sales to Prod.	90.6%	83.9%	95.5%	107.5%	90.6%	100.7%
KEROSENE—Gallons						
Stocks, Nov. 18	3,655,000	6,999,000	1,483,000	635,000	12,772,000	11,329,000
Prod. 11-18 to 11-25	1,374,000 — 9.2	3,076,000 + 0.2	1,427,000 + 0.1	672,000 — 12.8	6,549,000 — 3.4	6,306,000
Ship. 11-18 to 11-25	824,000 — 41.9	2,489,000 — 10.4	917,000 — 29.5	758,000 + 38.6	4,988,000 — 17.5	6,395,000
Stocks, Nov. 25	4,205,000 + 15.0	7,586,000 + 8.4	1,993,000 + 34.4	549,000 — 13.5	14,333,000 + 12.2	11,240,000
Ratio Sales to Prod.	60.0%	80.9%	64.3%	112.8%	76.2%	101.4%
STOVE DISTILLATE—Gallons						
Stocks, Nov. 18	4,837,000	6,907,000	2,184,000	31,000	13,959,000	13,995,000
Prod. 11-18 to 11-25	432,000 + 42.1	546,000 — 10.3	298,000 + 22.6	.....	1,276,000 + 10.4	1,544,000
Ship. 11-18 to 11-25	428,000 — 0.7	753,000 + 10.9	290,000 — 5.2	..... —100.0	1,471,000 + 2.2	977,000
Stocks, Nov. 25	4,841,000 + 0.1	6,700,000 — 3.0	2,192,000 + 0.4	31,000 0	13,764,000 — 1.4	14,562,000
Ratio Sales to Prod.	99.1%	137.9%	97.3%	.....	115.3%	63.3%
GAS OIL—Gallons						
Stocks, Nov. 18	9,032,000	41,685,000	18,556,000	8,642,000	77,915,000	74,838,000
Prod. 11-18 to 11-25	1,561,000 + 1.6	1,248,000 — 28.4	914,000 — 3.3	1,825,000 — 12.3	5,548,000 — 12.0	6,518,000
Ship. 11-18 to 11-25	1,827,000 + 22.7	950,000 — 11.2	1,552,000 +238.1	2,046,000 — 16.2	6,375,000 + 16.8	6,311,000
Stocks, Nov. 25	8,766,000 — 2.9	41,983,000 + 0.7	17,918 000 — 3.4	8,421,000 — 2.6	77,088,000 — 1.1	75,045,000
Ratio Sales to Prod.	117.0%	76.1%	169.8%	112.1%	114.9%	96.8%
FUEL OIL—Gallons						
Stocks, Nov 18	16,388,000	4,235,000	33,851,000	7,973,000	102,447,000	106 120,000
Prod. 11-18 to 11-25	5,888,000 — 2.9	7,063,000 + 9.4	9,164,000 — 5.0	5,479,000 — 5.5	27,594,000 — 1.3	26,351,000
Ship. 11-18 to 11-25	5,963,000 — 5.5	7,142,000 — 11.9	6,110,000 — 31.7	4,988,000 — 38.8	24,203,000 — 27.2	28,754,000
Stocks, Nov. 25	16,313,000 — 0.5	44,156,000 — 0.2	36,905,000 + 9.0	8,464,000 + 6.2	105,838,000+ 3.3	103,717,000
Ratio Sales to Prod.	101.3%	101.1%	66.7%	91.0%	87.7%	109.1%

Gasoline Produced by Various Methods, Week Ended November 25

	Kansas	% of Total	Oklahoma	% of Total	Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	5,465,000	63.5	11,223,000	76.0	6,294,000	79.1	1,660,000	48.7	24,642,000	71.0
Cracked	2,526,000	29.4	2,506,000	17.0	1,416,000	17.8	1,194,000	35.1	7,642,000	22.0
Natural	615,000	7.1	1,030,000	7.0	249,000	3.1	552,000	16.2	2,446,000	7.0
Total	8,606,000		14,759,000		7,959.000		3,406,000		34,730,000	

+ or — columns are % changes over previous week.

Gasoline Stocks Rise Although Output is Curtailed

TULSA, Nov. 29

Staff Special—By Telegraph

CHARGES of crude oil to stills at 79 Mid-Continent refineries in the week ended Nov. 25 were virtually unchanged from charges the preceding week. Charges of other oils were reduced approximately 3,500 barrels daily average. These 79 plants have 60 per cent of the operating capacity of the field.

Kansas refiners reduced crude throughput approximately 1,000 barrels daily but increased other oil charges approximately 700 barrels daily. They increased gasoline production approximately 115,000 gallons. Oklahoma refiners increased crude charges 2,200 barrels daily average but reduced charges of other oil. Their gasoline production fell 2,317,000 gallons. Texas refiners reduced crude charges more than 2,000 barrels daily

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Nov. 25. Change in stocks figured from Oct. 28.

GASOLINE

	Gallons
Production	143,112,000
Shipments	139,953,000
Net change in stocks	+3,159,000
Ratio sales to production	97.8%

KEROSENE

Production	25,486,000
Shipments	22,393,000
Net change in stocks	+3,093,000
Ratio sales to production	87.9%

STOVE DISTILLATE

Production	5,059,000
Shipments	5,857,000
Net change in stocks	—798,000
Ratio sales to production	115.8%

GAS OIL

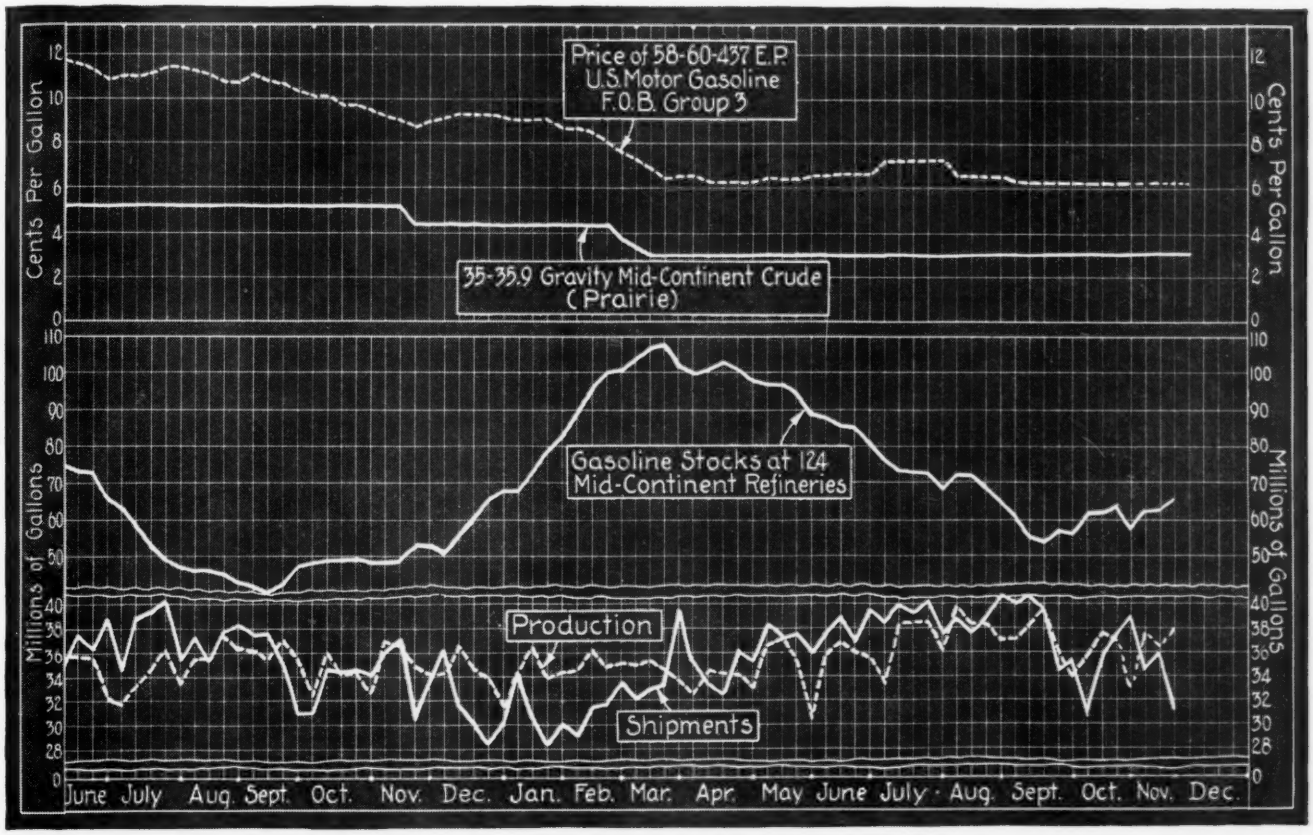
Production	27,602,000
Shipments	25,559,000
Net change in stocks	+2,043,000
Ratio sales to production	92.6%

FUEL OIL

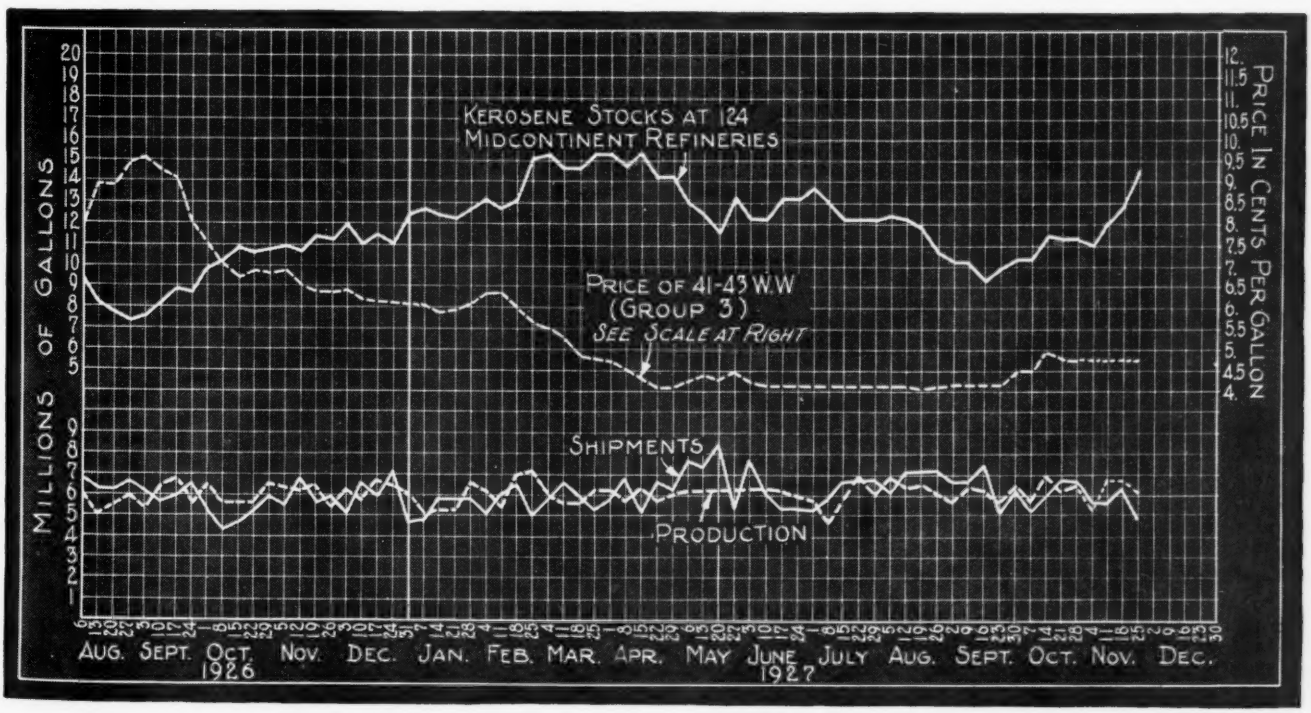
Production	112,233,000
Shipments	110,112,000
Net change in stocks	+2,121,000
Ratio sales to production	98.1%

Barometer of Mid-Continent Refinery Market—Week Ending November 25

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 124 Plants to National Petroleum News

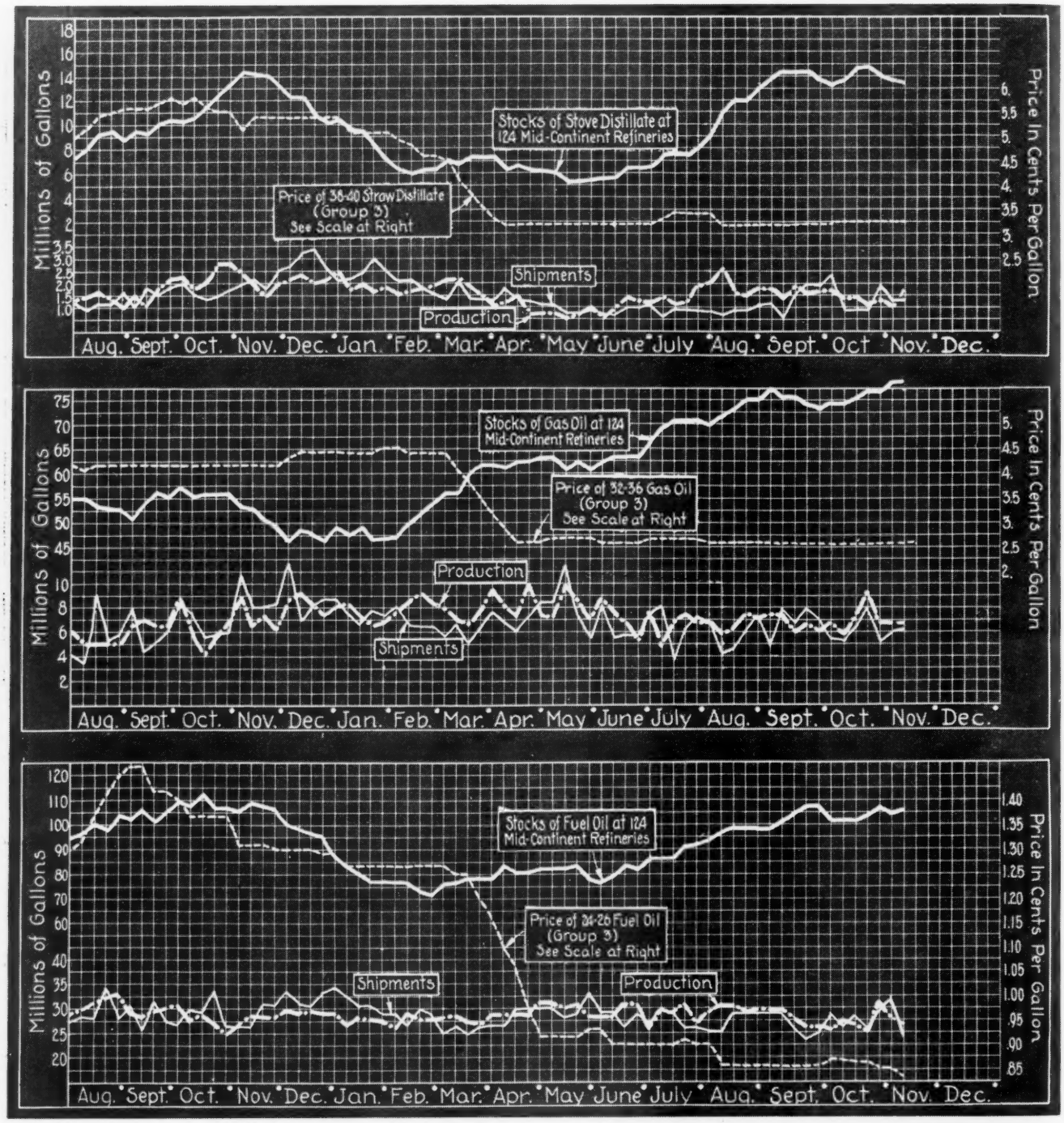

Price of 58-60-437 E.P. U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude (Prairie)
Cents Per Gallon
Gasoline Stocks at 124 Mid-Continent Refineries
Millions of Gallons
Production
Shipments
June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date shown in table on opposite page


KEROSENE STOCKS AT 124 MIDCONTINENT REFINERIES
PRICE OF 41-43 W.W. (GROUP 3) SEE SCALE AT RIGHT
SHIPMENTS
PRODUCTION
MILLIONS OF GALLONS
PRICE IN CENTS PER GALLON
AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1926
1927

Barometer of Mid-Continent Refinery Market—Week Ending November 25

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 124 Plants to National Petroleum News


Millions of Gallons
Price In Cents Per Gallon
Stocks of Stove Distillate at 124 Mid-Continent Refineries
Price of 38-40 Straw Distillate (Group 3) See Scale at Right
Shipments
Production
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct Nov. Dec.
Millions of Gallons
Price In Cents Per Gallon
Stocks of Gas Oil at 124 Mid-Continent Refineries
Price of 32-36 Gas Oil (Group 3) See Scale at Right
Production
Shipments
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
Millions of Gallons
Price In Cents Per Gallon
Stocks of Fuel Oil at 124 Mid-Continent Refineries
Price of 24-26 Fuel Oil (Group 3) See Scale at Right
Shipments
Production
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

average but increased other oils charges almost 2,000 barrels. They reduced gasoline production 914,000 gallons. Arkansas-Louisiana refiners increased crude runs approximately 700 barrels and reduced other oils charges 400 barrels with a new decline in gasoline production of 100,000 gallons.

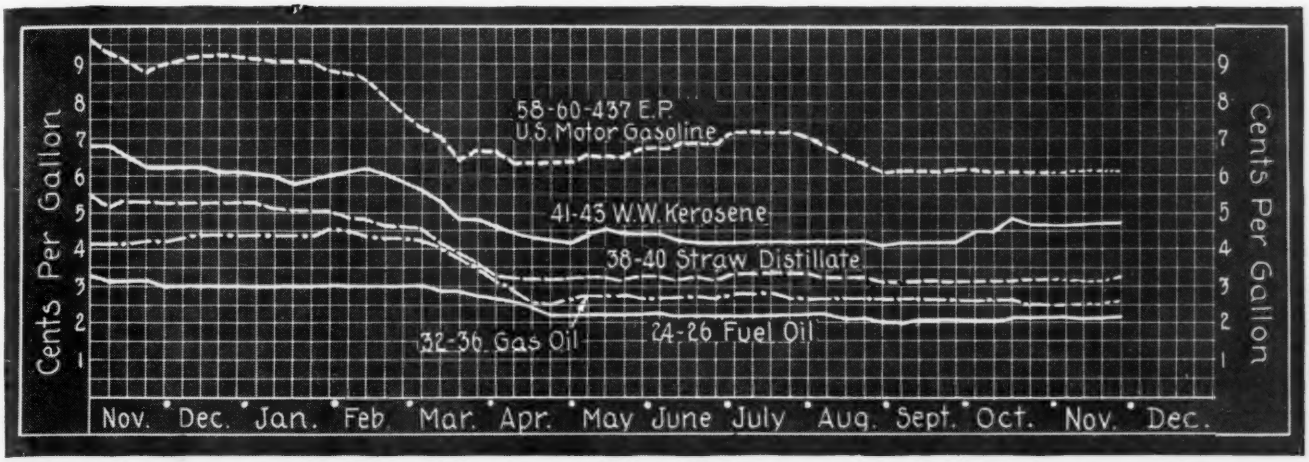
For the entire field therefore gasoline production fell 3,235,000 gallons to 34,730,000 gallons. Shipments fell faster than production, the decline being 4,588,000 gallons to 31,452,000 gallons. Only once since Feb. 15 have shipments been as low as they were last week. The low point in shipments was in the week ended Oct. 18, when shipments were 31,-102,000 gallons. Stocks of gasoline Nov. 25 totaled 66,701,000 gallons, an increase of 3,279,000 gallons since Nov. 18.

Except in Arkansas and Louisiana where little kerosene is made, kerosene business slumped. Production was curtailed approximately 200,000 gallons but shipments receded more than 1,000,000 gallons. Stocks increased approximately 1,500,000 gallons.

Heating distillate and gas oil stocks were the only major product stocks to be reduced last week. Colder weather in much of the territory where distillates and gas oil are used for heating caused in part this reduction.

Kansas refiners who in the week ended Nov. 18 led the field in ratio of sales to production of distillates, failed to ship their production last week but in Oklahoma sales were

Current Prices of Principal Mid-Continent Refined Products


Cents Per Gallon
58-60-437 E.P. U.S. Motor Gasoline
41-43 W.W. Kerosene
38-40 Straw Distillate
32-36 Gas Oil
24-26 Fuel Oil
Nov. Dec. Jan. Feb Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Prices shown are on Group 3 basis and extended to date shown in Refinery Market Tables in Market Section of this Issue

137.9 per cent of production. Stocks were reduced 195,000 gallons at the 79 plants.

Kansas, Texas and the Louisiana-Arkansas refiners reduced gas oil stocks. Oklahoma refiners added to their stocks. Production at the 79 refineries was down 758,000 gallons and shipments up 916,000 gallons. Stocks were reduced 820,000 gallons.

Fuel oil stocks were reduced in Kansas and Oklahoma but increased in Texas and Louisiana-Arkansas. Production was curtailed somewhat in all districts except Oklahoma while shipments were off everywhere. Stocks were increased 3,391,000 gallons to 105,838,000 gallons. This total is approximately 400,000 gallons under the total on hand a year ago.

Auto Output at Low Point

NEW YORK, Nov. 26.—*Automotive Industries* this week said:

Automobile production, except for a small minority of factories, is now at about the low point of the year. Dealers are being allowed to reduce stocks in preparation for the 1928 selling season. The heavy pressure sales campaigns put on by several important manufacturers last month have nearly all been terminated after surprisingly good results in view of the apathetic state of the market.

Consumers Oil Expands

MINNEAPOLIS, Nov. 26.—Consumers Oil Co., Lightwood, N. D., headed by L. J. Christensen, recently purchased the station properties of the Northern States Oil Co., Minneapolis. This gives the purchaser about 30 stations in Minnesota and the Dakotas.

Moves Los Angeles Office

LOS ANGELES, Nov. 25.—The Petroleum Rectifying Co. of California, announces the removal of their Los Angeles offices from the Union Oil building, to the Security Title building, 530 W. Sixth St. suite 714.

Refinery Equipment Maker Enlarges Its Scope

WARREN, Pa., Nov. 22.—The recent appointment of H. W. How, formerly chief engineer of the Buffalo Foundry & Machine Co., as permanent consulting engineer for the Struthers-Wells Co. here, heralds the opening of a busier manufacturing program for the coming year for that company, officials of the company announce.

A complete line of heat exchangers in five different types and size ranges and a new series of rotary air and direct heat dryers in standard sizes and construction has been developed.

Of interest to refiners will be the bubble towers, pipe stills, filters, mist separators and fuller's earth burners, high velocity evaporator, high temperature heat exchanger system for process work requiring temperatures higher than obtainable with steam, and a new system of evaporation and fusion, all of which will be included among the products the company will make. An improved type of continuous screw press for the extraction of oil and water from refuse materials will also be produced, it is announced.

Mr. How was formerly with the Thomas C. Basshor Co., Baltimore, the Southern Menhaden Co., Jacksonville, Fla. and during the war, manager of the naval engineering experiment station of the U. S. Navy at Annapolis.

Gets New Head for Grease Department

BUFFALO, N. Y., Nov. 26.—The American Lubricants, Inc., with headquarters here, has just appointed Arthur O. Davis as superintendent of its grease department. Mr. Davis was formerly for several years with the Cataract Refining Co., Swan & Finch, and more recently with the Capstone Mfg. Co., Newark, N. J.

The American Lubricants company began to make greases and soap about two years ago and is now supplying several automobile assembly plants with special greases, besides the goods it markets to jobbing trade. Its products are sold under the trade name Glidex.

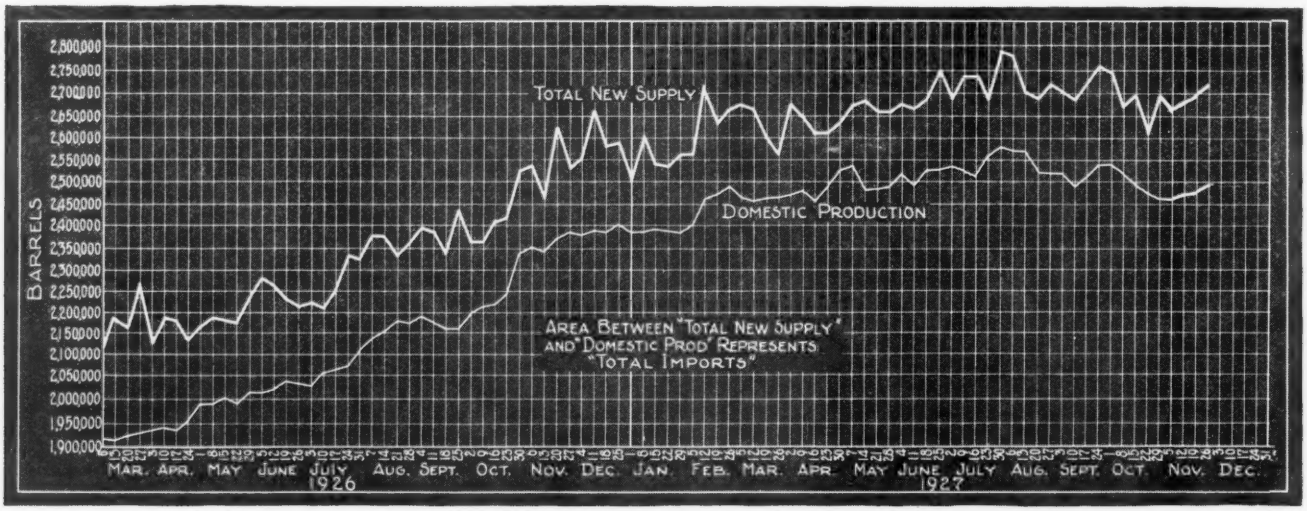
Officers are: John S. Embleton, president; George W. Miller, vice president; and Herbert Melvin, secretary and treasurer.

Bubble Towers

M. W. KELLOGG CO.
7 Dey Street - New York

Kansas City, Mo. . . . . 700 Baltimore Ave.
San Francisco, Cal. . . . . 444 Market St.
Los Angeles, Cal. . . . 329 Petroleum Sec. Bldg.

Daily Average Crude Oil Production and Imports



Daily average gross output of United States, by fields, for week ending with dates below as compiled by American Petroleum Institute

PRODUCTION SUMMARY

	Nov. 26	Nov. 19
Production east of Rockies	1,872,350	1,842,850
Increase		29,500
Total production in U. S.	2,498,350	2,466,950
Increase		31,400
Crude oil imports	220,857	218,286
Increase		2,571
Total crude supply	2,719,207	2,685,236
Increase		33,971

OKLAHOMA

	Nov. 26	Nov. 19
North Braman	3,000	2,800
South Braman	2,200	2,100
Blackwell	3,900	3,900
Hubbard	3,100	3,500
Thomas	2,150	2,200
Tonkawa	16,600	16,600
Garber	9,950	10,000
Burbank	37,850	38,750
Osage, outside Burbank	30,450	30,500
Watchorn	1,600	1,700
Cushing	21,300	21,300
Yale Jennings	9,500	9,500
Davenport	2,600	2,700
Bristow-Slick	24,900	24,950
North Okmulgee	16,200	16,200
Lyons-Deaner	6,300	6,300
Stroud	1,250	1,250
Cromwell	11,000	11,150
Papoose	6,100	6,050
Wewoka	10,900	11,400
Seminole	59,600	60,250
Bowlegs	131,150	129,500
Searight	27,050	26,700
Little River	42,000	44,850
Earlsboro	171,400	161,200
Duncan district	6,800	6,800
Graham	6,450	6,450
Fox	1,950	1,950
Healdton	14,700	14,700
Hewitt	9,400	9,400
Scholem Alechem	12,500	12,500
Others	71,150	71,150
Total Oklahoma	775,000	768,350
Increase		6,650

KANSAS

Greenwood County	32,100	32,400
Florence-Covert	1,500	1,500
Peabody-Elbing	3,900	3,900
Eldorado-Towanda	14,250	14,250
Augusta-Fox-Bush	4,250	4,200
Rainbow Bend	2,200	2,250
Russell	2,500	2,600
Churchill	13,500	13,000
Others	32,000	31,800
Total, Kansas	106,200	105,900
Increase		300

NORTH LOUISIANA

Homer	4,650	4,700
Haynesville	6,950	6,950
Caddo, light	12,400	12,600
Caddo, heavy	4,050	4,400
De Soto, Red River	4,350	4,050
Elm Grove	700	650
Bellevue	1,050	1,050
Cotton Valley	5,100	5,100
Urania	9,050	9,150
Pleasant Hill	850	850
Total, North Louisiana	49,150	49,500
Decrease		350

ARKANSAS

El Dorado	6,050	6,000
Smackover, light	9,500	9,700
Smackover, heavy	73,550	74,000
Stephens	1,200	1,200
Nevada	3,700	3,750
Lisbon	2,700	2,750
Others	100	100
Total, Arkansas	96,800	97,500
Decrease		700

TEXAS (OUTSIDE GULF COAST)

Panhandle District

Hutchinson county	59,500	59,150
Carson County	8,000	7,600
Gray County	15,100	14,300
Wheeler County	1,100	1,450
Others	100	50
Total, Panhandle District	83,800	82,550
Increase		1,250

North Texas

Burkburnett	12,300	12,400
Electra	12,100	12,200
Iowa Park and K-M-A	2,000	2,000
Wilbarger	11,500	11,300
Archer County	23,850	23,700
Montague-Cooke	16,000	16,100
Others	700	700
Total, N. Texas	78,450	78,400
Increase		50

West Central Texas

Stephens County	7,900	8,000
Eastland-Desdemona	8,200	8,300
Brown County	19,000	19,050
Coleman County	1,300	1,250
Callahan County	4,000	3,950
Shackelford County	5,350	5,200
Young County	9,600	9,700
Throckmorton County	1,350	1,300
Palo Pinto County	500	500
Others	1,300	1,300
Total, West Central Texas	58,500	58,550
Decrease		50

West Texas

Jones County	1,700	1,650
Mitchell and Scurry Counties	3,400	3,450
Howard County	4,200	4,300
Reagan County	23,600	22,700
Crane & Upton Counties	129,400	123,900
Crockett County	2,950	2,350
Pecos County	42,200	42,150
Winkler	30,900	17,650
Others	2,550	2,700
Total, W. Texas	240,900	220,850
Increase		20,050

East Central Texas

	Nov. 26	Nov. 19
Mexia	8,450	8,500
Currie	600	600
Richland	700	700
Wortham	2,450	2,500
Corsicana-Powell	13,500	13,600
Nigger Creek	2,250	2,450
Total, East Central Texas	27,950	28,350
Decrease		400

Southwest Texas

	Nov. 26	Nov. 19
Luling	14,500	14,750
Lytton Springs	1,600	1,600
Somerset	850	850
Laredo District	7,900	7,950
Piedras Pintas	.....	.....
Dale	350	400
Others	400	400
Total, Southwest Texas	25,600	25,950
Decrease		350
Total, Texas (Outside Gulf Coast)	515,200	494,650
Increase		20,550

GULF COAST

Coastal Texas

	Nov. 26	Nov. 19
West Columbia	9,000	9,100
Damon Mound	900	900
Big Creek	2,900	3,050
Boling	2,200	2,250
Blue Ridge	5,000	5,500
Pierce Junction	13,400	10,800
Humble	1,900	1,900
Goose Creek	7,700	7,850
South Liberty	2,500	2,500
Hull	14,000	14,950
Saratoga	1,000	1,050
Batson	1,300	1,300
Sour Lake	3,900	3,950
Spindletop	47,550	48,600
Orange County	4,000	4,400
Others	4,850	4,550
Total, Coastal Texas	122,100	122,650
Decrease		550

Coastal Louisiana

	Nov. 26	Nov. 19
Vinton	4,950	4,700
Lockport	5,800	5,950
Evangeline	1,250	1,300
Edgerly	2,000	2,400
Others	1,700	1,250
Total, Coastal Louisiana	15,700	15,600
Total, Gulf Coast	137,800	138,250
Decrease		450

ROCKY MOUNTAIN

Wyoming

Salt Creek	38,500	34,600
Grass Creek	2,650	2,650
Elk Basin	950	1,000
Big Muddy	2,800	2,750
Lost Soldier	2,800	2,600
Rock River	2,750	2,650
Lance Creek	1,050	1,300
Teapot Dome	.....	.....
Others	3,550	3,750
Total, Wyoming	55,050	51,300
Increase		3,750

Montana

Cat Creek	1,900	1,950
Sunburst	11,000	11,500
Others	150	250
Total, Montana	13,050	13,700
Decrease		650

Colorado

Moffat (Craig)	1,150	1,450
Fort Collins	3,150	2,950
Florence	800	800
Others	1,350	1,300
Total, Colorado	6,450	6,500
Decrease		50

New Mexico

Table Mesa	.....	.....
Artesia	1,250	1,250
Hogback	700	700
Rattlesnake	350	150
Others	100	100
Total, New Mexico	2,400	2,200
Increase		200
Total, Rocky Mountain	76,950	73,700
Increase		3,250

CALIFORNIA

Santa Fe Springs	39,000	39,000
Long Beach	106,500	104,000
Huntington Beach	61,000	61,000
Torrance	20,000	20,000
Dominguez	14,000	14,800
Rosecrans	10,000	8,000
Inglewood	32,000	32,000
Midway-Sunset	83,000	83,000
Ventura Avenue	52,500	52,300
Seal Beach	48,000	50,000
Others	160,000	160,000
Total, California	626,000	624,100
Increase		1,900

EASTERN

(Including Ill., Ind., Ky., Ohio, W. Va., Pa. and N. Y.)	115,250	115,000
Increase		250

New Well in Logan County, Oklahoma, Adds Interest to That Region

By Lawrence E. Smith

N. P. N. STAFF WRITER

TULSA, Nov. 26

FOR several years there has been desultory testing in Logan, southern Garfield and Kingfisher counties, Oklahoma. Not until the end of June, 1927, did anything really important happen. Then the Roxana Petroleum Corp. drilled into the Wilcox and found large production.

Harris & Haun, of Blackwell, on acreage held by them and Welch, Acton & Brown, at the end of the week added further to the big interest displayed in this territory. Their No. 1 Hall, NE SE of 11-18-4W, about 15 miles northwest of Guthrie, Logan county, capital of old Oklahoma territory, found oil in the Layton sand topped at 4758 feet. The sand was drilled 7 feet, or to total depth of 4765 feet.

The well made one flow Friday night lasting 30 minutes and at the end of the flow there were 4,200 feet of oil in the hole. Oil is 40.5 gravity.

This well is about seven miles southeast of the Roxana's No. 1 McCully, which is in the SW NE SE of 30-19N-4W. Roxana's well has total depth of 5985 feet and since it came in for its first big production on June 29 has held around 2,500 barrels daily. It is only slightly under that figure now.

Some 20 miles to the north is the Garber field. Layton sand production is found at Garber at the 3600-foot level and the sand has thickness in some wells of 75 feet. The Layton sand, of Pennsylvanian age, produces oil and gas in a number of the important fields of Oklahoma, including Cushing, Davenport and Tonkawa.

Several other tests have found gas and small oil production in horizons above the Wilcox. Structural determination in this territory is difficult—impossible, rather, in advance of drilling. Rock exposures are few and the thick section of red beds makes core drilling an expensive matter, marker horizons being found at depths much greater than in territory where the core drill is used extensively.

About two and one-half miles northeast of the Harris & Haun well is a Wilcox failure. Carter Oil Co.'s No. 1 Rogers, SW NE SW of 32-19N-3W, went to 6218 feet, being finished several months ago. It got top of sand at 6105 feet and the result was a hole full of water.

Similarly, there is a deep dry hole northwest of the Roxana's producer. Bu-vi-bar Oil Co.'s test in the SE SW of 16-19N-5W, over in Kingfisher county, was a failure at 6210 feet. This is about five miles from the Roxana well.

The area is undergoing a comprehensive testing now and while it will be drilled sparingly for a time, because of the high costs of putting down such deep holes, the middle of next year should see the operators possessing considerable information on the possibilities. The status of operations in Logan county at this time is as follows:

Champlin Refining Co. No. 1 Musgrove, SE SW of 8-19N-4W, drilling at 2279 feet.

Roxana Petroleum Corp. No. 1 Freelove, SWc of 17-19-4, coring at 4574 feet.

Sinclair Oil & Gas Co.'s No. 1 Weber, SE SE SE of 18-19-4, drilling by drill pipe at 3620 feet.

Twin State Oil Co. No. 1 Shaffer, NW NW NW of 20-19-4, building rig.

Roxana Petroleum Corp. No. 1 Stephens, SWc of 29-19-4 (on tract adjoining discovery well farm), drilling at 5802 feet.

Roxana Petroleum Corp. No. 1 Ross, NW of 29-19-4, drilling at 5375 feet.

Roxana Petroleum Corp. No. 1 Sebranek, SE NE of 30-19-4, fishing at 5221 feet.

L. H. Wentz, No. 1 Williams, NE of 31-19-4, drilling by tools at 5315 feet.

Roxana Petroleum Corp. No. 1 Williams, NWc of 32-19-4, drilling at 5377 feet.

Bryan & Emery, NW SE of 33-19-4, fishing for drill pipe.

Roxana Petroleum Corp. No. 1 McDaniels, NE SW of 16-18-4, rigging up.

Marland Oil Co. No. 1 Gragg, SW NE of 16-18-4, drilling at 1100 feet.

Mid-Continent Petroleum Corp. No. 1 Poston, SE NW of 16-18-4, digging cellar.

Blackwell Oil & Gas Co. No. 1 Sode, NE SW of 28-18-4, sand 4023-35, three bailers water per hour, shut down at 4146 feet.

Sinclair Oil & Gas Co. No. 1 Knecht, SW SW NE 28-18-4, cementing 8-inch at 4775 feet.

Texas Pacific Coal & Oil Co. No. 1 Quigley, NW NE NW of 28-18-4, location.

Healdton Oil & Gas Co. No. 1 Gragg, SW of 29-18-4, drilling at 1915 feet.

Texas Pacific Coal & Oil Co. No. 1 Speaks, SE NW of 33-18-4, sand 4134-44, three million feet of gas and 65 barrels, 65 per cent water. Shut down.

RAMSEY BROTHERS No. 1 Smith, NE, SW of 38-18-4, drilling at 3645 feet.

Haley & Pioneer Petroleum Co., No. 1 Quier, SW SE of 33-18-3, fishing for casing at 3690 feet.

Other tests are under way elsewhere in the county but these are the operations in the "hot" area. There has been a persistent leasing

Drilling Operations in Oklahoma, Kansas and Texas, Week Ended November 26, 1927

	November 26 — Week Ended —					November 19				
	Loc.	Rigs	Drg.	S.D.	Total	Loc.	Rigs	Drg.	S.D.	Total
OKLAHOMA										
Burbank	6	4	14	5	29	..	10	8	5	23
Other Osage	9	8	22	5	44	9	5	19	5	38
Bristow-Cushing	6	4	32	6	48	8	6	31	6	51
North Oklahoma	12	9	77	38	136	13	9	68	41	131
South Oklahoma	6	21	119	28	174	8	20	115	31	174
Muskogee	..	8	28	24	60	..	8	33	22	63
Okmulgee-Bristow	7	32	62	18	119	7	29	67	16	119
Tonkawa	1	1	2	2	6	1	..	4	2	7
Seminole Dist	16	24	251	21	212	15	16	287	24	342
Total Oklahoma	63	111	607	147	928	61	103	632	152	948
KANSAS	28	53	104	67	252	29	46	124	65	264
TEXAS										
Central	..	124	205	138	467	..	128	197	122	447
Panhandle	..	92	95	81	266	..	96	81	97	274
N. Central	..	53	102	23	178	..	54	99	25	178
West	..	132	187	122	442	..	136	189	124	449
Laredo	..	1	25	19	45	..	1	25	19	45
Total Texas	..	402	614	383	1,399	..	415	591	387	1,393
GRAND TOTAL	91	566	1,325	597	2,579	90	564	1,347	604	2,602

Seminole District Production by Companies and Leases, November 25 and November 18, 1927

Company	Farm	S.T.R.	Nov. 25th No. Wells	Nov. 25th Prod.	Nov. 18th No. Wells	Nov. 18th Prod.
BOWLEGS						
Amerada	Rascoe	15- 8-6	8	4,050	8	4,085
Atlantic	Baker	1- 8-6	4	1,099	4	1,205
Atlantic	Fleet	23- 8-6	4	867	4	951
Atlantic	Grayson	12- 8-6	2	2,229	2	1,575
Atlantic	A. Jones	10- 8-6	3	163	3	179
Atlantic	C. Jones	9- 8-6	2	418	2	395
Total Atlantic			15	4,358	15	4,311
Barnsdall	McNac	28- 8-6	1	40	1	40
Barnsdall	Murrow	11- 8-6	4	1,268	4	1,092
Total Banrsdall			5	1,308	5	1,132
Carter	Bowlegs	15- 8-6	3	1,495	3	1,525
Carter	Burden	23- 8-6	3	555	2	600
Carter	Jones	11- 8-6	3	4,595	3	4,810
Carter	Harjoche	15- 8-6	6	1,230	6	1,255
Carter	Hilly	23- 8-6	2	1,390	2	1,155
Carter	Walker	15- 8-6	2	420	2	70
Carter	Melisse		1	2,455	1	3,260
Carter	Wise	23- 8-6	12	9,110	12	9,735
Total Carter			33	21,250	31	22,410
Empire	Lacey	15- 8-6	6	845	6	911
Empire	Wise	23- 8-6	2	1,542	2	1,443
Total Empire			8	2,387	8	2,354
Gypsy	Bowlegs	22- 8-6	1	302	1	252
Gypsy	Bradley	9- 8-6	1	115	1	50
Gypsy	Brown	33- 8-6	1	50	1	52
Gypsy	Dosar	7- 8-6	1	100	1	100
Gypsy	Cumsey	8- 8-6	4	1,715	4	2,032
Gypsy	Grayson	13- 8-6	4	2,527	4	3,157
Gypsy	Henderson	13- 8-6	1	165	1	335
Gypsy	Jones	11- 8-6	1	515	1	510
Gypsy	Walker	15- 8-6	8	3,260	8	1,632
Gypsy	Wise	23- 8-6	3	245	3	190
Total Gypsy			25	8,944	25	8,360
Independent et al	Coker	21- 8-6	1	0	1	166
I. T. I. O.	Barnett	24- 8-6	2	855	2	845
I. T. I. O.	Billington	22- 8-6	5	829	5	1,001
I. T. I. O.	Bowlegs	22- 8-6	11	1,373	11	1,536
I. T. I. O.	Davis	13- 8-6	4	2,825	4	3,142
I. T. I. O.	Fay	18- 8-6	6	4,665	6	4,896
I. T. I. O.	Goforth	15- 8-6	11	2,480	11	1,614
I. T. I. O.	Hull	26- 8-6	1	32	1	441
I. T. I. O.	Livingston	15- 8-6	11	6,201	11	6,092
I. T. I. O.	Lizzie	11- 8-6	2	1,221	2	1,492
I. T. I. O.	Walker	15- 8-6	8	1,405	8	1,351
I. T. I. O.	Wilmont	15- 8-6	4	1,673	4	1,770
I. T. I. O.	Work	24- 8-6	1	0	1	48
I. T. I. O.	Youngblood	22- 8-6	2	16	2	237
Total I. T. I. O.			68	25,597	68	25,425
McCulloch	Bowlegs	22- 8-6	2	197	3	125
Magnolia			1	206	0	0
Magnolia	B. F. Davis	13- 8-6	1	1,071	1	700
Total Magnolia			2	1,277	4	805
McCulloch	Bowlegs	22- 8-6	2	197	0	0
Mid-Continent	Baker	10- 8-6	4	1,979	4	1,982
Mid-Continent	Bowlegs	22- 8-6	1	205	1	340
Mid-Continent	Hutke		1	2	0	0
Mid-Continent	Smith	12- 8-6	4	935	4	640
Total Mid-Continent			10	3,121	9	2,962
Minnehoma	Bowlegs	15- 8-6	4	257	4	320
Prairie	Gahagan	23- 8-6	4	1,605	4	1,125
Prairie	Harber	10- 8-6	7	3,820	7	4,065
Prairie	Jones	11- 8-6	2	2,785	2	3,270
Prairie	Templeton	12- 8-6	4	5,605	4	5,430
Prairie	Whitney	23- 8-6	4	135	4	150
Total Prairie			21	13,950	21	14,040
Pure	Reed	14- 8-6	15	6,595	15	6,726
Pure	D. Strother	14- 8-6	3	1,146	3	1,355
Pure	F. Strother	10- 8-6	2	988	2	672
Total Pure			20	8,720	20	8,758
Roxana et al	Taylor	16- 8-6	6	1,577	6	1,729
Shaffer	Lacey	14- 8-6	3	802	3	720
Sinclair	Bowlegs	22- 8-6	1	95	1	105
Sinclair	Cumsey	10- 8-6	2	5,085	2	5,270
Sinclair	Ellen	11- 8-6	6	3,565	6	3,432
Sinclair	Harjo	14- 8-6	3	1,570	3	1,335
Sinclair	Jones	8- 8-6	6	6,745	5	7,015
Sinclair	Taylor	10- 8-6	4	5,185	4	2,825
Sinclair	Walker	22- 8-6	4	1,320	4	1,555
Total Sinclair			26	23,565	25	21,537
Texas	Reed	14- 8-6	9	6,410	9	6,803
Tidal	Grayson	13- 8-6	3	1,945	3	1,920
Tidal	Harjoche	10- 8-6	6	3,390	6	2,790
Total Tidal			9	5,335	9	4,710
Twin State	Jones	10- 8-6	2	130	2	135
TOTAL BOWLEGS			281	131,712	280	131,489
LITTLE RIVER						
Amerada	Fore	35- 8-6	1	845	1	990
Amerada	Nitey	35- 8-6	4	3,035	4	3,185
Total Amerada			5	3,880	5	4,175
Blackwell	Nitey	35- 8-6	8	5,760	7	5,360
Carter	Fish	1- 7-6	1	750	1	775
Continental	Cozar	2- 7-6	2	1,285	2	1,410
Gypsy	Campbell	36- 8-6	2	936	2	1,005
Gypsy	Nungee	1- 8-6	1	102	1	0
Gypsy	Pottey	35- 8-6	1	1,167	1	1,280
Gypsy	Wadsworth	1- 7-6	1	42	1	0
Total Gypsy			5	2,247	5	2,285
Independent	Harris	23- 7-6	1	108	1	58
I. T. I. O.	Campbell		1	252	0	0
I. T. I. O.	Dungan	35- 8-6	3	4,040	3	3,735
I. T. I. O. MA	House	1- 7-6	1	967	1	1,201
I. T. I. O. WE	House-A	1- 7-6	1	65	1	180
I. T. I. O. WE	House-B	2- 7-6	3	2,940	3	2,811
I. T. I. O.	Jackson	1- 7-6	3	3,309	3	3,654
I. T. I. O.	McCulla	1- 7-6	3	1,209	3	1,226
I. T. I. O.	Nitey	2- 7-6	5	2,732	5	3,132
I. T. I. O.	Phoebe-A	36- 8-6	2	721	2	732
I. T. I. O.	Phoebe-B	36- 8-6	2	984	2	1,227
I. T. I. O.	Reed	1- 7-6	1	241	1	201
I. T. I. O.	Soketneche	1- 7-6	4	1,443	4	1,615
Total I. T. I. O.			29	18,903	28	19,614
Mid-Continent	Wadsworth	26- 8-6	7	2,785	7	4,115
Mid-Contient	Smith		1	35	1	55
Total Mid-Continent			8	2,820	8	4,170
Philmack	Davis	1- 7-6	1	1,365	1	1,432
P & R	House	2- 7-6	4	2,985	3	2,925
Roxana	Smith	1- 7-6	1	20	1	20
Superior	Wadsworth	1- 7-6	1	37	1	23
Texas	Coker	1- 7-6	3	1,060	3	860
Tidal	House	1- 7-6	2	1,685	2	1,760
Tidal	Johnson	1- 7-6	1	90	1	0
Total Tidal			3	1,775	3	1,760
TOTAL LITTLE RIVER			73	42,995	70	44,867
EARLSBORO						
Amerada	Anderson	15- 8-6	3	2,570	3	2,710
Amerada	Cowden	4- 9-5	8	2,350	8	1,955
Amerada	Rodgers	3- 9-5	2	710	2	830
Total Amerada			13	5,630	13	5,495
Barnsdall	Brown	10- 9-5	4	4,309	4	4,731
Barnsdall	Bruner-F	2- 9-5	2	874	2	1,095
Barnsdall	Bruner-N	11- 9-5	4	3,601	3	5,381
Barnsdall	Cudjo	11- 9-5	1	31	1	29
Barnsdall	Davis-D	11- 9-5	3	4,090	3	1,479
Barnsdall	Davis-J	11- 9-5	3	3,794	3	3,952
Barnsdall	Davis-M	11- 9-5	3	1,068	3	1,106
Barnsdall	Gibson	9- 9-5	7	3,712	7	4,196
Barnsdall	Ingram	4- 9-5	7	9,088	7	9,078
Barnsdall	Pack	10- 9-5	4	539	4	551
Barnsdall	Peter	10- 9-5	4	388	4	447
Barnsdall	Sango	2- 9-5	2	0	0	0
Barnsdall	Sebolka	15- 9-5	1	1,452	1	1,409
Barnsdall	Smith		1	336	0	0
Barnsdall	Sullivan-H	11- 9-5	2	0	2	51
Barnsdall	Sullivan	10- 9-5	3	74	3	55
Barnsdall	Watsutke	12- 9-5	4	1,108	3	923
Total Barnsdall			55	35,055	50	34,493
Carter	Davis	13- 9-5	1	1,395	1	1,475
Carter	Payne	12- 9-5	3	1,185	3	1,340
Carter	Sango	2- 9-5	3	8,840	3	8,686
Total Carter			7	11,420	7	11,500
Continental	Kays	2- 9-5	2	1,305	2	1,440
Continental	Spencer	12- 9-5	4	1,585	4	2,805
Total Continental			6	2,890	6	4,245
Crosbie	Bryant	9- 9-5	2	685	2	1,348
Empire	Barker	12- 9-5	1	3,532	1	3,617
Empire	Edmundson	3- 9-5	3	1,871	3	2,236
Total Empire			4	5,403	4	5,853
Gypsy	Bruner	10- 8-6	4	6,320	4	6,982
Gypsy	Carter	11- 9-5	9	7,255	9	7,770
Gypsy	Hunick	5- 9-5	1	557	1	552
Gypsy	Noble	12- 9-5	4	8,475	4	4,335
Gypsy	Peter	10- 9-5	6	1,037	6	1,122
Gypsy	State	16- 9-5	4	1,617	4	827
Gypsy	Sango	1- 9-5	4	5,715	3	1,293
Total Gypsy			32	30,986	31	22,881
Independent	Bruner	10- 9-5	4	1,720	4	1,825
Independent	Gaines	11- 9-5	2	6,000	2	6,605
Independent	Knappen	8- 8-5	5	4,222	5	3,575
Independent	O'Dell	4- 9-5	4	250	4	500
Independent	Sullivan	10- 9-5	4	20	4	45
Total Independent			19	12,212	19	12,550
Interocean	Payne	12- 9-5	1	0	1	20
Magnolia	Bryant	9- 9-5	6	2,238	6	2,101
Magnolia	Cowden	4- 9-5	4	20	4	71
Magnolia	Dixon		1	187	1	72
Magnolia	Edmundson	3- 9-5	2	727	2	734
Magnolia	Holmsley	11- 9-5	7	4,890	7	2,449
Magnolia	Ingram	10- 9-5	1	15	1	37
Magnolia	Lena	10- 9-5	3	135	3	327
Magnolia	Seay	12- 9-5	5	1,936	5	1,392
Magnolia	Simpson	10- 9-5	4	640	4	400
Magnolia	Sparks	11- 9-5	7	7,303	7	4,376
Magnolia	Sullivan	12- 9-5	2	1,463	2	1,901
Total Magnolia			42	19,554	42	13,860
Mid-Continent	McCumber	9- 9-5	7	2,335	7	2,250
Mid-Kansas	Anderson	14- 9-5	3	642	3	670
Phillips	Dunnaway	15- 9-5	1	30	1	31
Phillips	Graham	9- 9-5	7	410	7	447
Total Phillips			8	440	8	478

(*Continued on Page 43*)

Seminole District Production by Companies and Leases, November 25 and November 18, 1927

(*Continued from Page 42*)

Company	Farm	S.T.R.	Nov. 25th No. Wells	Nov. 25th Prod.	Nov. 18th No. Wells	Nov. 18th Prod.
Prairie	Baker	23- 9-5	1	100	1	50
Prairie	Davis	13- 9-5	4	1,735	4	1,635
Prairie	Graham-C	3- 9-5	2	1,100	2	1,265
Prairie	Graham-O	10- 9-5	4	4,160	4	4,190
Prairie	Stidham	11- 9-5	13	9,140	13	10,335
Total Prairie			24	16,236	24	17,475
Roxana	Bayliss	17- 9-5	1	17	1	17
Roxana	Spencer	12- 9-5	2	937	2	815
Total Roxana			3	954	3	832
Shaffer	Clark	1- 9-5	4	682	4	679
Sinclair	Hollins	12- 9-5	3	1,110	3	425
Sinclair	Sango	2- 9-5	1	1,775	1	2,085
Total Sinclair			4	2,885	5	2,520
Skelly	Spencer	12- 9-5	2	2,372	2	2,845
Texas	Anderson	2- 9-5	5	1,582	3	1,090
Texas	Brown	10- 9-5	7	1,825	7	1,405
Texas	Rodgers	5- 9-5	3	6,495	3	7,115
Texas	Wilmont	10- 9-5	6	3,150	6	4,145
Total Texas			21	13,052	19	12,755
Tidal	Watkins	9- 9-5	5	2,875	5	2,545
Twin State	Baker	12- 9-5	4	95	4	265
Twin State	Hearn	2- 9-5	2	8,240	2	4,315
Total Twin State			6	8,335	6	4,850
TOTAL EARLSBORO			270	174,642	264	159,814
TOTAL LITTLE RIVER			73	42,995	70	44,867
TOTAL SEARIGHT			64	27,516	62	26,317
TOTAL BOWLEGS			281	131,712	280	131,489
TOTAL SEMINOLE			320	59,794	324	59,785
GRAND TOTAL SEMINOLE DISTRICT			1,009	436,659	1,000	422,272
Average per well				432		422

Completions in N.E. Central, West, Panhandle and North Texas, Week Ended November 26, 1927

NORTH AND EAST CENTRAL TEXAS

Brown County

Company	Well Farm	Location Survey	Depth	Init. Prod.
Humble	13-Armstrong	Delgado	1201-1223	45
Cranfill et al	14-Smith	SA&MG	1341-1360	50
Humble	8-Gilbraith	SA&MG	1310-1324	239
Selby	21-Ellis	SA&MG	1318-1351	50
Massey	1-Stewart	Hagelin	1042-1045	6
Harper	1-George		T.D. 1700	Dry
Golden Rod	2-King	GM&D	T.D. 1535	Dry
Lehman et al	2-Evans	Woodward	T.D. 709	Dry

Callahan County

Bradstreet et al	1-Long	Comal	T.D. 471	Dry
Gibson et al	3-Snider	BBB&C	T.D. 1105	Dry
Reid et al	2-Hood	D&DA	T.D. 455	Dry
Gilett	1-Hickman	D&DA	T.D. 1041	Dry
Shaw et al	8-Miller	Comal	1632-1647	30
Goodloe et al	1-Alvord		T.D. 1003	2M

Coleman County

Tower et al	1-Hassard	Cleman	T.D. 2175	Dry
Inglewright et al	1-McClure	Warton	T.D. 1617	Dry

Eastland County

Gulf	9-Parsons	McLennan	1614-1619	120

Jack County

Buttram	3-Jones	SP	1998-2008	117
Security	3-Cullers	Cullers	1997-2006	145

Limestone County

Lewis et al	2-Lewis	Varella	2336-2901	100
Hughes	1-Lewis	Varella	T.D. 2989	Dry
Transcont	2-Dugger	Varella	T.D. 3046	Dry

NORTH TEXAS

Archer County

Wright et al	7-Miller	DCSL	740-742	6
Consolidated	1-Carter	SP	T.D. 1852	Dry
Long	1-Marsh	Harris	T.D. 1456	Dry
Johnson	1-Ward	TE&L	T.D. 1364	Dry

Cooke County

Carey et al	3-Koelzer	Scott	1374-1397	12
Continental	2-Koelzer	Scott	1365-1390	29
Oil Oper. Trust	7-Luke	MT	1647-1669	30

Clay County

Carter et al	1-Henderson	TE&L	T.D. 910	Dry

Grayson County

Simpson	1-Wahl	Reeves		2M

Knox County

Deep Rock	1-Beaver	H&TC	T.D. 3500	Dry

Montague County

McGinley et al	1-Leadham	Tatum	T.D. 2003	Dry
Continental	1-Edmondson	Edmondson	1326-1332	30
Christie et al	1-Heaton	Buckman	756-794	4

Wichita County

Sheldon	2-Honaker	Cole	1646-1661	32
Texas	335-Waggoner	GC&SF	1936-1944	32
Hobbs	1-Watkins	KWVFL	1523-1525	80
Vergate	12-K & K	Roesh	1786-1791	100
Steadman et al	1-Henson	BS&F	T.D. 1907	Dry
Hammon	1-Mitchell	Castleman	T.D. 1896	Dry
O'Neil et al	2-K & K	KWVFL	T.D. 1855	Dry

Wilbarger County

Humble	1-Castleberry	H&TC	T.D. 2583	Dry
Phillips	8-Waggoner	H&TC	1857-1862	160
Phillips	9-Waggoner	H&TC	2305-2395	48
Waggoner	3-Waggoner	H&TC	2380-2400	22
Milham Corp.	12-Waggoner	H&TC	2547-2565	5

Young County

Atlantic et al	1-Mothers	TE&L	T.D. 1303	Dry

PANHANDLE

Carson County

Magnolia	5-Fee	I&GN	3091-3158	220
Empire	5-Burnett	I&GN	2175-2412	41M

Gray County

Gulf Prod	1-Bowers	H&GN	T.D. 3115	5000

Hutchinson County

Mid-West Expo	8-Whittemburg	M&C	2950-2964	10

Moore County

Skelly	1-Armstrong	Crasmore	3200-3232	140

Wheeler County

Texas	1-Morgan	H&GN	1850-2017	20M
Hatcher et al	1-Fee	H&GN	1450-1531	29M

WEST TEXAS

Crane County

Gulf	2-Waddell	PSL	3219-3508	30
Gulf	43-McIlroy	CCSD	2667-2879	592

Glasscock County

Harrison et al	2-Roberts	W&NW	1877-1891	25
Harrison et al	3-Roberts	W&NW	1847-1860	31

Howard County

Magnolia	2-Chalk	W&NW	1625-1655	51
Magnolia	7-Chalk	W&NW	1645-1683	26
Magnolia	8-Chalk	W&NW	1634-1667	30
Magnolia	3-Hyman	W&NW	1580-1605	40
Marland et al	1-Settles	W&NW	1376-1382	168
Marland	1-Haines	TP	3440	Dry
Marland	1-Guitar	B&C	T.D. 3509	Dry

Pecos County

Mid-Kans. et al	1-Smith	GCSF	T.D. 1565	Dry
Anderson et al	1-McKenzie	GCSF	T.D. 2596	Dry
Marland et al	7-Yates	TC	1250-1310	650
California	3-Smith	TC	1425-1535	103
Humble	2-Smith	TC	1425-1510	110
Marland	2-Yates	I&GN	T.D. 1045	354
Marland	3-Yates	I&GN	1084-1148	720
Marland	4-Yates	I&GN	970-1055	135
Mid-Kans. et al	6-Yates	I&GN	985-1072]	2582
Mid-Kans. et al	2-Yates	I&GN	955-993	1000
Mid-Kans	3-Yates	I&GN	1030-1150	108

campaign throughout Logan, Oklahoma, Kingfisher, and latterly it has spilled over into Blaine and Canadian counties. It hasn't been exciting, but most of the companies are taking some protection acreage, realizing that the Seminoles cannot last forever.

Speaking of Seminole, the prophets have been confounded each day for the past two weeks and they are now wondering whether it will be necessary to invoke proration again. The district mounted steadily through the week, jumping 2,000 barrels each day, until it hit 436,659 barrels the 24 hours ended at 7 a. m., Nov. 25.

There was a gain of 9 wells from Nov. 18 to Nov. 25 and an increase in production of 14,387 barrels as of those two dates, Earlsboro being responsible for all of it.

The increase is mainly due to the persistent shooting campaign. Since late October, when the operators' committee and the umpire began to grant permission to shoot, finally making it a free-for-all on Nov. 1, the blasting has been going on steadily and about 200 wells have been touched up. Little River alone is still under the shooting ban. In Earlsboro they took the wells a row at a time and shot nearly everything that was worth it. About 100 wells were thus spurred on to better their performances. New wells are now being shot, in some instances, as they are completed, a practice that was taboo in the old-fashioned days of proration.

All this shooting could not help but maintain production, although the decline should be forthcoming soon. The question is how long is temporary?

Here and there in the district, tentative prodding around reveals from time to time spots that will be active

Completions in Oklahoma and Kansas, Week Ended November 26, 1927

OKLAHOMA

Beckham County

Company	Well No.	Location	Depth	Init. Prod.
Magnolia	2	NWc 28-9-23 W	2659-2683	38M

Carter County

Company	Well No.	Location	Depth	Init. Prod.
Magnolia	1	NWc SW 23-1-3 W	2370-2425	50

Creek County

Company	Well No.	Location	Depth	Init. Prod.
Bu-Vi-Bar	1	SEc 24-15-7 E	3390-3394	15
Continental	1	NEc 26-18-11 E	1906-1926	100
Tibbens	2	NWc SE SW 4-18-12 E	2090-2093	5M
Ray	1	NEc SW NE 13-17-10 E	1873-1897	25
Prod. & Ref	4	SWc SE NE 18-14-10 E	3427-3459	320
Wilcox	2	SEc NW SE 18-14-10 E	3414-3427	125
Kennedy	2	SWc SE SE 13-17-10 E	T.D. 2520 OWD	Dry
McCready	1	SWc NE SE 30-17-11 E	T.D. 1825	Dry
Grayhoma et al	1	NEc SW NE 32-16-9 E	T.D. 2993 OWD	Dry

Garfield County

Company	Well No.	Location	Depth	Init. Prod.
Summers et al	1	NEc NW 31-21-5 W	T.D. 1665	Dry

Grady County

Company	Well No.	Location	Depth	Init. Prod.
Garvin	1	SEc NE 18-4-6 W	T.D. 2325	Dry
Magnolia	3	SWc NW SE 35-5-8 W	2150-2350	23M
Harwell	1	C NE NW 14-4-8 W	1760-1780 OWD	10M
Carter	8	SWc SE SW 16-3-5 W	1839-1913	170

Jefferson County

Company	Well No.	Location	Depth	Init. Prod.
Lash et al	1	SEc NE SE 18-7-5 W	830-836	20

Kay County

Company	Well No.	Location	Depth	Init. Prod.
Harris et al	1	C SE NE 8-27-1 W	3668-3680	3
Marland	4	NEc SE SE SW 19-27-1 W	697-702	13M
Larutan	1	NWc 29-27-1 W	701-706	1M
Gypsy	3	SWc SE NE 9-25-2 W	4412-4415	46
Gypsy	2	SEc SW NE 9-25-2 W	T.D. 4765	Dry

Lincoln County

Company	Well No.	Location	Depth	Init. Prod.
Magnolia	1	NWc SE 7-14-4 E	T.D. 4780	Dry

McIntosh County

Company	Well No.	Location	Depth	Init. Prod.
Aggas et al	3	SEc NW NW 11-12-15 E	T.D. 1834	Dry
Aggas et al	4	NWc SW NW NW 11-12-15 E	T.D. 844	Dry
Sessions	2	CSL SE SW 16-12-15 E	T.D. 735	Dry
Sessions	3	CEL SE SW 16-12-15 E	664-668	½M

Muskogee County

Company	Well No.	Location	Depth	Init. Prod.
Sunray	1	NEc SW 5-14-19 E	T.D. 701	Dry
Hale et al	1	NEc NW NE NW 7-14-19 E	T.D. 959	Dry

Okmulgee County

Company	Well No.	Location	Depth	Init. Prod.
Lakeside	1	SEc NW SW 26-13-11 E	T.D. 2500	Dry
Kirkland et al	7	NWc SE NW 17-15-13 E	1384-1430	10
Pine	2	CEL SE NW 10-15-14 E	970-996	15
Hutchinson et al	4	SWc SE NW 6-14-13 E	2083-2140	10&1M
Sharpe et al	4	CWL NE NW 16-14-14 E	1258-1270	18
Lambert	2	CNL S½ NW SW 21-13-15 E	1600-1698	.15M
Bison	2	NEc SE NE 19-12-13 E	2189-2192	30&½M

Osage County

Company	Well No.	Location	Depth	Init. Prod.
Kewanee	2	SEc NE 3-26-6 E	2746-2817	1245
Okla. Natl.	778	SEc SW SW 6-21-12 E	1332-1364	1M

Pawnee County

Company	Well No.	Location	Depth	Init. Prod.
Sheltz et al	2	C NW NE 5-20-8 E	2470-2513	20

Pontotoc County

Company	Well No.	Location	Depth	Init. Prod.
Shaffer	1	NWc NE 36-5-7 E	2280-2340	160
Louisiana	2	SWc SE 17-5-8 E	2447-2474	1000
Ramsey	2	NWc NE SW 20-5-8 E	2450-2527	720
American	1	CSL N½ N½ SE 27-5-6 E	T.D. 2135	Dry

Pottawatomie County

Company	Well No.	Location	Depth	Init. Prod.
Barnsdall	8	SWc NW NE 9-9-5 E	4360-4374	45M
Magnolia	5	NWc SE NW 9-9-5 E	4315-4327	120
Continental	3	NEc SW 19-7-4 E	3693-3762	1130

Seminole County

Company	Well No.	Location	Depth	Init. Prod.
Prairie	4	SWc NW NW 13-9-5 E	4317-4329	880
Prairie	4	SWc SE SE 12-8-6 E	4344-4351	2720
Prairie	3	SEc NW SE 2-7-6 E	4267-4275	2000
Prairie	2	NWc SW SE 12-8-6 E	4435-4444	400
Prairie	3	SEc SW SE 12-8-6 E	4262-4281	915
Gypsy	4	SWc NW SE 1-9-5 E	4298-4404	1085
Texas	1	NEc SE SE 2-9-5 E	4392-4404	225
Carter	4	SWc NW SE 12-9-5 E	4300-4308	230
Amerada	2	SEc NW NE 3-9-6 E	4325-4335	627
Wilcox	7	NWc NE NW 4-9-6 E	4441-4442	1014
Carter	1	SEc NE SW 9-8-6 E	4225-4229	1335
Mid-Continent	4	SEc SW SW 12-8-6 E	T.D. 4215	400
I. T. I. O.	1	SWc NW SW 13-8-6 E	4356-4367	759
Continental	1	SEc NW 36-8-6 E	4473-4477	600
I. T. I. O.	2	SWc NE SW 36-8-6 E	4210-4218	805
I. T. I. O.	3	NEc SW 36-8-6 E	4441-4444	721
Mid-Continent	6	NWc SE SW 36-8-6 E	4124-4136	1950
Gypsy	1	NWc SE 1-7-6 E	4250-4255	30
I. T. I. O.	2	NWc SE NW 1-7-6 E	4139-4149	622
I. T. I. O.	3	SWc NW NE 1-7-6 E	4222-4227	1088
Roxana	1	SWc NE NE 1-7-6 E	4248-4254	40
Texas	1	NWc SW 1-7-6 E	4150-4158	255
Texas	3	SEc NE SW 1-7-6 E	4234-4238	780
Amerada	4	NWc SE NE 2-7-6 E	4311-4319	1070
Magnolia	3	NEc SE SW 12-9-5 E	T.D. 4488	Dry
Empire	1	NWc SW 34-9-5 E	T.D. 5028	Dry
Pure	8	SEc NW NW 36-9-6 E	T.D. 4130	Dry
I. T. I. O.	3	SWc SE SW 13-8-6 E	T.D. 4258	Dry
Carter	3	SWc SE SW 15-8-6 E	T.D. 4220	Dry
I. T. I. O.	8	NEc NW NE 15-8-6 E	T.D. 3600	Dry
I. T. I. O.	4	SEc NW NE 1-7-6 E	T.D. 4614	Dry

Stephens County

Company	Well No.	Location	Depth	Init. Prod.
Magnolia	4	NWc NE SE 32-1-8 W	T.D. 2430 OWD	Dry
Magnolia	1	SEc 15-1-8 W	T.D. 3004 OWD	Dry
Dameron et al	1	NEc NW SE 11-3-6 W	T.D. 850	Dry
Medlin	1	SEc SW SE SW 27-1-8 W	1699-1702	60
Tuchy et al	1	NEc NW NE 10-3-5 W	1024-1037	10

Tulsa County

Company	Well No.	Location	Depth	Init. Prod.
Jackson et al	2	CWL SW NE 21-19-12 E	1549-1580	25
Anthony	8	CNL NW 3-16-12 E	1668-1710	3M
Sand Springs Home	2	C N½ SE NE 4-19-11 E	T.D. 2250	Dry

Wagoner County

Company	Well No.	Location	Depth	Init. Prod.
Knox et al	1	C SW SE 12-17-16 E	T.D. 817	Dry

KANSAS

Coffey County

Company	Well No.	Location	Depth	Init. Prod.
Sheedy et al	2	SEc 11-23-13 E	1762-1803	20

Cowley County

Company	Well No.	Location	Depth	Init. Prod.
Wakefield et al	1	Lot 1 Blk-41	2499-2517	.8
Shawver et al	1	SEc SW NE 29-30-5 E	T.D. 2356	Dry

Greenwood County

Company	Well No.	Location	Depth	Init. Prod.
Federal	2	NWc 30-22-13	T.D. 1775	Dry
Shaffer et al	1	Lot 5, N NEc	T.D. 1875	Dry
Cross et al	1	NEc SE 15-25-13 E	T.D. 1657	Dry
Ballard et al	1	NEc SE NE 2-26-10 E	T.D. 2076	Dry
Wahn et al	1	NEc NW NW 2-26-10 E	T.D. 2060	Dry
Culp et al	1	SEc NE NE 33-27-13 E	T.D. 1790	Dry
Theta	1	SEc 23-22-12 E	1670-1703	320
Empire	3	NEc 25-22-12 E	1681-1738	360
Empire	4	NEc 25-22-12 E	1684-1698	50
Empire	4	NEc NW NW 25-22-12 E	1682-1717	400
Darby	1	SWc NW NW 30-22-13 E	1690-1748	300
Lassen et al	2	SWc NE NW 7-25-9 E	2258-2288	25

McPherson County

Company	Well No.	Location	Depth	Init. Prod.
Texas	1	NWc NE NW 32-18-2 W	2943-2967	7M

Russell County

Company	Well No.	Location	Depth	Init. Prod.
Mid-West	21	NEc SW SW 30-12-15 W	3048-3063	75

Sumner County

Company	Well No.	Location	Depth	Init. Prod.
Champlin	1	NWc NE SW 9-30-2 W	3023-3049	45
Champlin	2	SEc SW NW 9-30-2 W	2015-2031	5M
Roxana	3	SEc SW NE NW 36-31-2 E	1888-1931	700
Shawver et al	1	Lot 8 Blk.-85 11-32-2 E	2053-2138	800
Roxana	1	CEL SW NE 14-32-2 E	2012-2094	300
Roxana	5	Lot 9, Blk-37, 14-32-2 E	2030-2117	800
Roxana	4	Lot 6, Blk-52, 14-32-2 E	2014-2116	900
Roxana	6	Lot 4, Blk.-86, 14-32-2E	2040-2115	800
Roxana	1	Lot 28, 14-32-2 E	2074-2132	180
Flitch et al	1	Lot 16, Blk-17, 11-32-2E	T.D. 2196	Dry
Fine et al	1	Lot 3, Blk-18, 11-32-2 E	T.D. 2154	Dry
Ozark	1	Lot 6, Blk 15, 12-32-2 E	T.D. 2249	Dry
Palmer et al	1	SWc NW 12-32-2 E	T.D. 3206	Dry
Moore et al	1	Lot 29, Blk 31, 12-32-2 E	T.D. 2629	Dry
Tress	1	Lot 17, 12-32-2 E	T.D. 2292	Dry
Roxana	1	C NW 36-32-2 E	T.D. 3533	Dry

Woodson County

Company	Well No.	Location	Depth	Init. Prod.
Brinegar et al	1	SEc SW SE 14-26-14 E	T.D. 1342	Dry

later on, when normal markets—still remembered by some of the old timers—return. One of the wildcats that was much discussed for some time is the Snowden & McSweeney No. 1 Tiger, in the NW of 13-7-6, a mile south of Little River production. It got a good showing of oil in the Simpson formation, which immediately overlies the Wilcox. The Simpson was topped at 4255 feet, the well drilled to 4264 feet and shut down. It will be drilled a little deeper and produced at 100 barrels daily or so, as is now the fashion with several wildcat producers in the district.

In the next township east of the Seminole City pool, the Prairie Oil & Gas Co. may, in time, open something more. The company's No. 1 Stubbs, NW NE NE of 18-9-7, topped the Hunton formation at 4030 feet and at 4040 feet got a first oil and gas. It is now swabbing 90 barrels per day and will not be drilled to the Wilcox immediately.

It frequently happens that the town whose name is given to an oil field is in barren territory. During the past week Smith and others completed their townsite well, SE NW NW of 27-9-6. Top of the Wilcox was 4515 feet and the well was abandoned 10 feet deeper with hole full of water.

Just north of Oklahoma City, J. I. Cromwell is still drilling on his second test. Last December a flurry arose over the discovery of 32 gravity oil in a test by the same operator in the SW NE SE of 10-12N-3W. Total depth of this well was 4387½ feet.

The second test, No. 1 Thompson, in the SW NE NE of 15-12N-3W, is drilling at 6300 feet. Geological identification of the formations showed that the top of the Mississippian was reached at 6230 feet. It apparently has still some distance to go before the Wilcox horizon is reached.

In the Panhandle of Texas, Danciger et al got another well in the Bowers pool of Gray county, now the locality of principal interest out there. The well, No. 3 Jackson, in Sec. 88, Block B-2, H. & G. N. Survey, found granite wash pay at 2944-72 feet and made 250 barrels first hour.

Reading Pipe
"Cheaper in the Long Run"

Birch Oil Company Tries Steel Pipe for a Cooling Tower for 2 months—that's all it lasted

Now They Specify READING

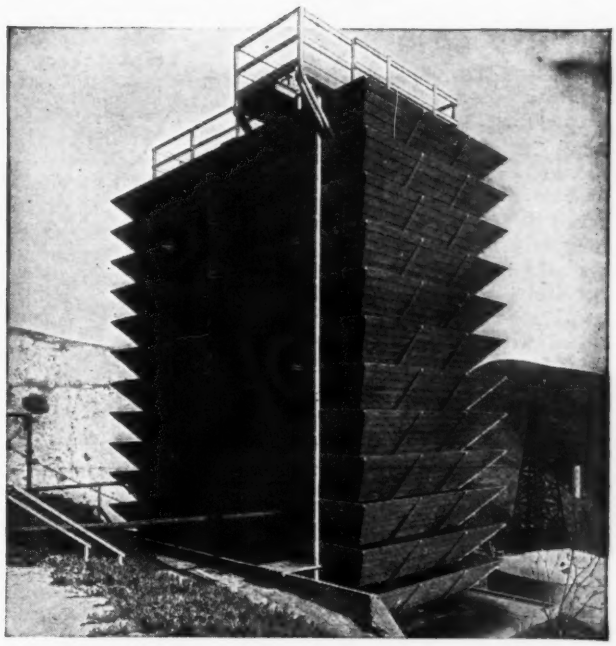
Reading Iron Company,
441 Pacific Mutual Building,
Los Angeles, California.

Gentlemen:

Replying to your inquiry as to the reason for our specifying "Reading Iron Pipe" on our order a short time ago, we beg to advise that this pipe was to be used for cooling coils in our water tower, and our previous experience demonstrated that steel pipe would not withstand certain elements in the water which caused corrosion, whereas, the iron pipe was not affected in the least.

When this cooling tower was built about a year ago, we installed second hand Reading Iron Tubing for coils, and these coils are in just as good condition today as they were when put into operation. About two or three months ago we found it necessary to install additional coils, and as we had no Reading Tubing on hand at the time, we built these of steel tubing which lasted about two months and were replaced with the Reading Iron purchased a short time ago. After about two months service the steel tubing had corroded so bad, that leaks were discovered in many places, and on examination, we found the entire steel installation completely gone.

We also find Reading Iron Tubing an eliminator of trouble in crooked holes where we have had considerable trouble with rod cut tubing. The Iron tubing apparently withstands the abrasive effect caused from continual contact with the rod couplings better than the harder steel tubing.



Cooling Tower on the Property of Birch Oil Company

Although the first cost may be slightly higher, we feel that in many instances the Reading Iron installation will prove cheaper in the long run.

Thanking you for the interest you have shown in our past relationship, and assuring you of our hearty cooperation, we are,

Yours very truly,

BIRCH OIL CO.

J. H. Royer

Superintendent

READING PIPE
GENUINE WROUGHT IRON

READING IRON COMPANY HOUSTON, TULSA, SHREVEPORT, LOS ANGELES READING, PENNSYLVANIA

Gasoline Manufacturers Revise Test Method for Sulfur Determination

CLEVELAND, Nov. 24.

FOLLOWING are the specifications for natural gasoline promulgated by the Association of Natural Gasoline Manufacturers, revised Nov. 1 as to methods of sulfur determination:

"1. This method of test shall be used for the detection of free sulfur and corrosive sulfur compounds in gasoline.

"2. A clean strip of mechanically polished pure sheet copper about ½ inch in width and 3 inches in length shall be placed in a suitable clean tube or sample bottle. Gasoline under test shall be added so that the copper strip is completely immersed. The test tube or sample bottle shall be closed with a loosely fitting cork and held in a suitable bath at 122 degrees Fahr. (50 degrees Cent.)

"At the end of three hours the gasoline exposed strip shall be removed and shall be compared with a similar strip of freshly polished copper.

"3. The presence of sulfur or corrosive sulfur compounds is indicated by the corrosion or discoloration of the gasoline exposed strip when compared with the fresh copper strip.

"4. (a) Gasoline shall be reported as passing the test when on examination the exposed strip shows not more than extremely slight discoloration as compared with the fresh copper strip.

"(b) Gasoline shall be reported as not passing the test when on examination the exposed strip shows more than extremely slight discoloration as compared with the fresh copper strip.

"**Color**—The color of all products must be plus 25 Saybolt chromometer. All tests are to be made in accordance with the latest approved methods of the American Society for Testing Materials. That portion of the standard method of distillation test for natural gasoline, serial designation D216-27 adopted June, 1927, by the A. S. T. M., is quoted in so far as procedure is concerned.

"**Sampling**—Samples should be collected in a previously cooled bottle, preferably by immersing the bottle in the liquid, where possible, and discarding the first sample. Where immersion is not possible the sample should be drawn off into a previously cooled bottle in such a manner that agitation is kept at a minimum. Immediately close the bottle with a tight-fitting stopper, and place in an ice bath or refrigerator capable of bringing the gasoline to a temperature of not less than 32 degrees Fahr. (0 degrees Cent), nor more than 40 degrees Fahr. (4.45 degrees Cent).

"(a) The condenser bath shall be filled with cracked ice and enough water added to cover the condenser tube. The temperature shall be maintained between 32 and 34 degrees Fahr. (0 and 1.1 degrees Cent.). Agitation with air greatly aids in maintaining the required temperature range.

"(b) The condenser tube shall be swabbed to remove any liquid remaining from the previous test. A piece of soft cloth attached to a cord or copper wire may be used for this purpose.

"(c) One hundred cubic centimeters of the product shall be measured in the 100 cc graduated cylinder at 32 to 40 degrees Fahr. (0 to 4.45 degrees Cent.) and transferred directly to the Engler flask. Both the flask and the graduated cylinder shall have been cooled to a temperature of from 32 to 40 degrees Fahr. (0 to 4.45 degrees Cent.) before use. None of the liquid shall be permitted to flow into the vapor tube.

"(d) The thermometer provided with a cork shall be fitted tightly into the flask so that it will be in the middle of the neck and so that the lower end of the capillary tube is on a level with the inside of the bottom of the vapor outlet tube at its junction with the neck of the flask.

"(e) The charged flask shall be placed in the 1¼-inch (3.175-cm) opening in the 6 by 6-inch (15.24 by 15.24-cm.) asbestos board with the vapor outlet tube inserted into the condenser tube. A tight connection may be made by means of a cork through which the vapor tube passes. The position of the flask shall be so adjusted that the vapor tube extends into the condenser tube not less than 1 inch (2.54 cm.) nor more than 2 inches (5.08 centimeters).

"(f) The graduated receiver used in measuring the charge shall be placed, without drying, at the outlet of the condenser tube in such a position that the condenser tube shall extend into the graduate at least 1 inch (2.54 centimeters) but not below the 100-cubic centimeter mark. The graduate shall be immersed at least up to the 100-cubic centimeter mark in a transparent bath maintained between the temperature of 32 and 34 degrees Fahr. (0 and 1.11 Cent.). The top of the graduate shall be covered closely during the distillation with a piece of blotting paper, or its equivalent, and cut to fit the condenser tube tightly.

"A lead washer, or other suitable material, resting on the blotting paper, is a convenient accessory as it serves to hold the paper tightly against the top of the graduate and also provides the additional weight necessary to overcome the buoyant effect of the liquid in the cooling bath.

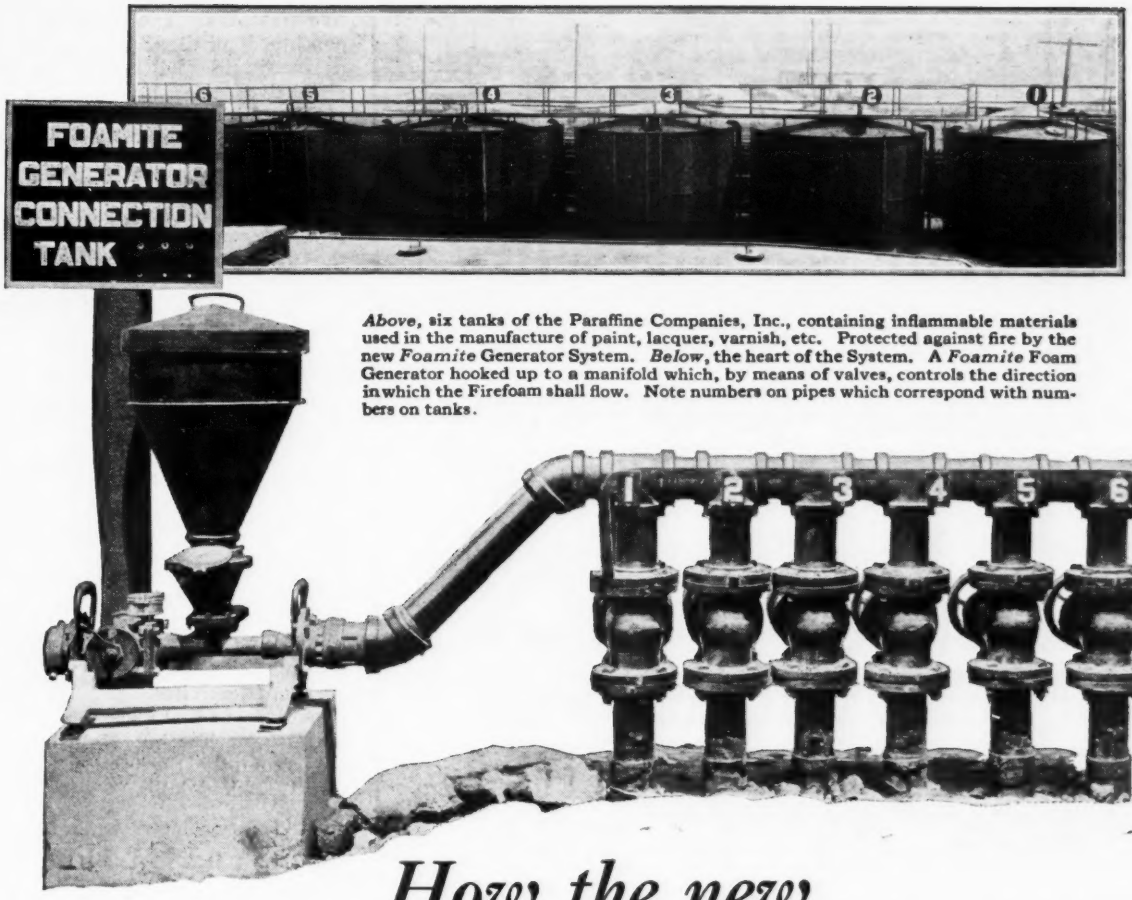
WHEN everything is in readiness heat shall be applied at a uniform rate, so regulated that the first drop of the condensate falls from the condenser in not less than two nor more than five minutes. When the first drop falls from the end of the condenser, the receiving cylinder shall be moved so that the end of the condenser tube shall touch the side of the cylinder. The heat shall then be so regulated that the first 10-cubic centimeters or distillate shall be recovered in not less than three nor more than four minutes. Thereafter, the rate of distillation shall be maintained uniformly at not less than 4 nor more than 5 cubic centimeters per minute. The reading of the distillation thermometer shall be recorded when the level of the distillate reaches each 10-cubic centimeter mark on the graduate.

"When the liquid residue in the distillation flask is approximately 5 cubic centimeters, the heat may be increased because of the pressure of heavy ends which have relatively high boiling points. However, no further increase of heat shall be applied after this adjustment. The 4 to 5-cubic centimeter rate cannot always be maintained from this point to the end of the distillation, but in no case shall the period between the point when approximately 5-cubic centimeters of the liquid remains in the flask and the end point be more than

Official Natural Gasoline Requirements

Grade "Double A"	Recovery	Not less than 90%
	End Point	Not over 375° F.
	Gravity	80.0 to 87.9° Be.
Grade "A"	Recovery	Not less than 90%
	End Point	Not over 375° F.
	Gravity	72.9 to 79.9° Be.
Grade "Double B"	Recovery	Not less than 85%
	End Point	Not over 375° F.
	Gravity	84.0 to 92.0° Be.
Grade "B"	Recovery	Not less than 85%
	End Point	Not over 375° F.
	Gravity	76.0 to 83.9° Be.
Grade "C"	Recovery	Not less than 78%
	End Point	Not over 375° F.
	Gravity	80.0 to 92.0° Be.

All Grades must be Non-Corrosive according to A.S.T.M. Method D130-27T.



Above, six tanks of the Paraffine Companies, Inc., containing inflammable materials used in the manufacture of paint, lacquer, varnish, etc. Protected against fire by the new *Foamite* Generator System. *Below*, the heart of the System. A *Foamite* Foam Generator hooked up to a manifold which, by means of valves, controls the direction in which the Firefoam shall flow. Note numbers on pipes which correspond with numbers on tanks.

How the new
Foamite Generator System
meets the fire protection needs of this great plant

SIX TANKS containing distillate and asphalt —highly inflammable!

This fire risk of the Paraffine Companies, Inc., of San Francisco, had to be protected. The engineers in charge did not think the installation of a standard *Foamite* Two-Solution System justifiable. Yet they could not take chances with unproven safeguards which might fail in a crisis.

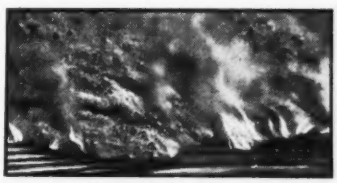
The answer to their problem—and to thousands of similar problems—is the new *Foamite* Generator System. For here is the same proven, dependable protection as the standard Two-Solution System—in a form especially adapted to moderate-sized risks.

In both set-up and operation the new System is simple and economical. A *Foamite* Foam Generator is hooked up with a series of fixed pipes leading to the tanks. Should fire break out in one of these tanks, fire-killing Firefoam—produced in the Generator by the automatic mixture of *Foamite* Generator Powder and flowing water—is carried directly to that tank and there distributed over the burning surface. In a few minutes the fire is completely out.

Adequate protection!

Write for detailed information and ask for a demonstration of the *Foamite* Foam Generator.

American La France & Foamite Corporation, 294 Turner St., Utica, N. Y. Successors to American La France Fire Engine Co., Inc. and Foamite-Childs Corporation. Representatives at points convenient to all principal oil producing and refining centers.



The new Foamite *System described above produces genuine, upstanding Firefoam by the use of* Foamite *Generator Powder—a single powder patented and exclusively controlled by this company.*

Foamite-Childs Protection
A Complete Engineering Service
Against Fire

Maybe "your best friend won't tell you" but your red ink will. For even tanks have halitosis (unpleasant breath). And although tank breathing may not affect your olfactory nerves it sure does affect your profits. That's the insidious thing about it.

Tanks have to breathe and it doesn't take long to waste $75 in gasoline-laden breath. That's all it costs for a 6-inch Oceco Breather Valve. Write today for full information. The Oil Conservation Engineering Co., 877 Addison Rd., Cleveland, O.

five minutes. The heating shall be continued until the mercury reaches a maximum and starts to fall consistently.

"The highest temperature observed on the distillation thermometer shall be recorded as the end point. Usually this point will be reached after the bottom of the flask has become dry. If the bottom of the flask is not dry, the operator should note this on his report.

"The total volume of the distillate collected in the receiving graduate shall be recorded as the 'recovery.'

"The cooled residue shall be poured from the flask into a small cylinder graduated in tenths of a cubic centimeter, measured when cool, and the volume recorded as 'residue' at 32 to 40 degrees Fahr. (0. to 4.45 Cent.).

"The difference between 100 cubic centimeters and the sum of the recovery and the residue shall be calculated and recorded as 'distillation loss.'

"**Note**—Complete description of apparatus can be found in 1927 Report of Committee D-2 on Petroleum Products and Lubricants, American Society for Testing Materials, obtainable from the Society at 1315 Spruce street, Philadelphia."

Crude and Gasoline Stocks Gain Less in October

NEW YORK, Nov. 29.—While stocks of crude in pipe lines, tank farms and refineries east of the Rockies increased in October, the amount of gain was only about half of the gain in September. Stocks of refined products, except kerosene, increased in October, as compared with decreases in September, according to American Petroleum Institute.

Pipe line and tank farm gross domestic crude stocks east of Rockies increased 2,763,000 barrels in October, as compared with September's gain of 5,235,000 barrels, while crude stocks at refineries increased 846,000 barrels in October, compared with a gain of 1,445,000 barrels in September.

All refinery stocks showed net decrease of 63,000 barrels in October, as compared with net decrease of 819,000 barrels in September, at plants covering 88 per cent of the country's operating capacity east of California.

Gasoline stocks gained 83,000 barrels in October, compared with a gain of 2,257,000 barrels in September. Kerosene stocks decreased 419,000 barrels.

Gas and fuel oil stocks increased 56,000 barrels, and lube oil stocks gained 9,000 barrels in October.

TULSA.—J. H. Greer has been appointed general superintendent of the southwest division, Pure Oil Co., succeeding J. W. Rush. Mr. Greer was transferred from the Arkansas division of the Pure.

Principles of Operation of the Plunger Pump in Oil Wells

By Lester C. Uren

Professor of Petroleum Engineering, University of California

Article 3. Part I

THE two previous articles of this series have been concerned with the principles of operation of the oil-well plunger pump, considering particularly the various factors which influence its operating efficiency. Having now a knowledge of the conditions with which the pump must contend, and of the difficulties attending its operation, we are in a position to consider the various types of plunger pumps that have been developed to cope with the conditions imposed.

A variety of different forms of pumps are available, some of which are especially adapted to the handling of sandy oil, or mixtures of gas and oil, while others are designed to facilitate withdrawal and re-placement of wearing parts. The different types vary widely in the form, number and arrangement of valves, as well as in construction details of plungers, working barrels and other features.

Cup-Packed Plunger Pumps

THE earliest type of oil-well plunger pump, and one still widely employed in shallow well service, makes use of a plunger composed of a metal body supporting a working valve and some form of cup packing, reciprocating in a cylindrical cast-iron working barrel. (See Figure 1.) Either leather, vulcanized or composition cups may be used, and generally the plunger assembly will provide for four or six, one above another. The cups are mounted with their open side uppermost, so that the fluid pressure from the accumulated oil in the tubing above, will press them tightly against the polished inner surface of the working barrel. Metal follower rings separate and support the cups and prevent them from being distorted under high fluid pressure. This type of plunger is secure against oil leakage only under low or moderate pressure conditions such as would be encountered in wells of comparatively shallow depth.

Both the standing and working valves are of the common ball and ground reversible-seat type, the standing valve being supported in a conical recess in the standing valve barrel which forms the bottom collar or foot-piece of the working barrel. The standing-valve body is also equipped with packing, either in the form of leather or composition washers or cups, or Babbitt metal (see Figure 9) to provide a frictional hold which prevents it from being forced upward into the working barrel by the suction effect of the rising plunger, or by the upward pressure of the incoming oil.

Types of Oil-Well Plunger Pumps

Herewith is Part I of Article 3 of a series of five written by Lester C. Uren exclusively for NATIONAL PETROLEUM NEWS on "Principles of Operation of the Plunger Pump in Oil Well." Article 3 discusses the various types of plunger pumps. Part II 3 will be published in the Dec. 7 issue.

Article 4, descriptive of oil-well pumping appliances and incidental pumping equipment will appear in an early issue of NATIONAL PETROLEUM NEWS.

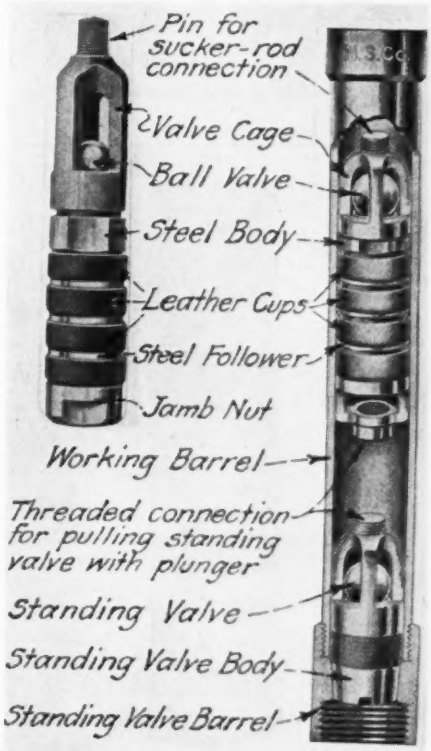


Fig. 1—Typical leather-cup packed plunger in common form of cast iron working barrel

The Steel-Plunger Liner-Barrel Pump With Garbutt Rod Attachment

DEVELOPMENT of the plunger type of pump to contend with the high fluid pressures characteristic of deep well conditions, and to resist sand abrasion, has led to the widespread use of a type of pump which employs a long cylindrical steel plunger instead of the packed type of plunger described in the preceding section. This plunger is highly polished on its external surface and accurately dimensioned to fit snugly within the polished inner surface of the working barrel. Plungers of this type are preferably made of special steel tubing, range from four to six feet in length and have metal walls about one-fourth of an inch in thickness. The working valve with its seat and cage, is ordinarily attached to the upper end of the plunger, while the standing valve occupies its usual position in the lower end of the working barrel. (See Figure 2.)

As a means of withdrawing the standing valve with the sucker rods and plunger, when repair work or replacement of working parts is necessary, a Garbutt rod is customarily attached to the top of the standing valve cage, extending up through the plunger nut on the lower end of the plunger, and to some distance up inside of the latter. There is sufficient space between the plunger nut and the Garbutt rod for passage of oil, the rod remaining stationary while the plunger moves up and down. A nut is attached to the upper end of the Garbutt rod, the stroke of the plunger being adjusted so that the Garbutt rod nut does not strike either the plunger nut or the working valve in normal operation; but on withdrawing the plunger from the working barrel, the Garbutt rod nut engages the plunger nut and the Garbutt rod and standing valve are raised from their position in the lower end of the working barrel.

Working Barrels

Working barrels range from 5 to 20 feet in length, depending upon the length of the plunger

and that of the stroke to be used, and must be accurately bored and polished on the interior surface to provide a snug fit with the plunger. Some manufacturers provide a clearance of only 0.00025 inch between the plunger and barrel.

The difficulty of accurately boring a long working barrel, has led to the use of sectional liners which can be accurately bored and assembled in such a way as to form an absolutely straight cylinder, uniform in internal diameter and of any desired length. Liners of this type are usually made of a good quality of gray cast iron, individual sections being 12 inches long and carefully machined so that they fit accurately together when placed in a steel pipe casing or "jacket," end to end. (See Figures 2 and 3.) They are assembled on a snug-fitting mandrel, and while supported in this way, are forced together to form a rigid tube by end pressure developed by a pair of collars, one of which is screwed on each end of the jacket. A working barrel equipped with liners of this type has the advantage that irregular wear in one part or another of the barrel may be remedied by replacing worn sections of the liner, and even though a complete replacement of the liners may be necessary, the jacket and collars need never be scrapped.

A novel type of working barrel designed for more complete exclusion of gas from the pump than is possible with the common form of plunger pump, is illustrated in Figure 4. This device is really a combination gas anchor and working barrel. Oil is admitted through holes near the upper end of the barrel, and flows down between the jacket and the liner, into a closed reservoir formed by a joint or two of tubing below the standing valve, and capped at the lower end. Oil is drawn through this reservoir through a short tube screwed to the lower end of the standing-valve body.

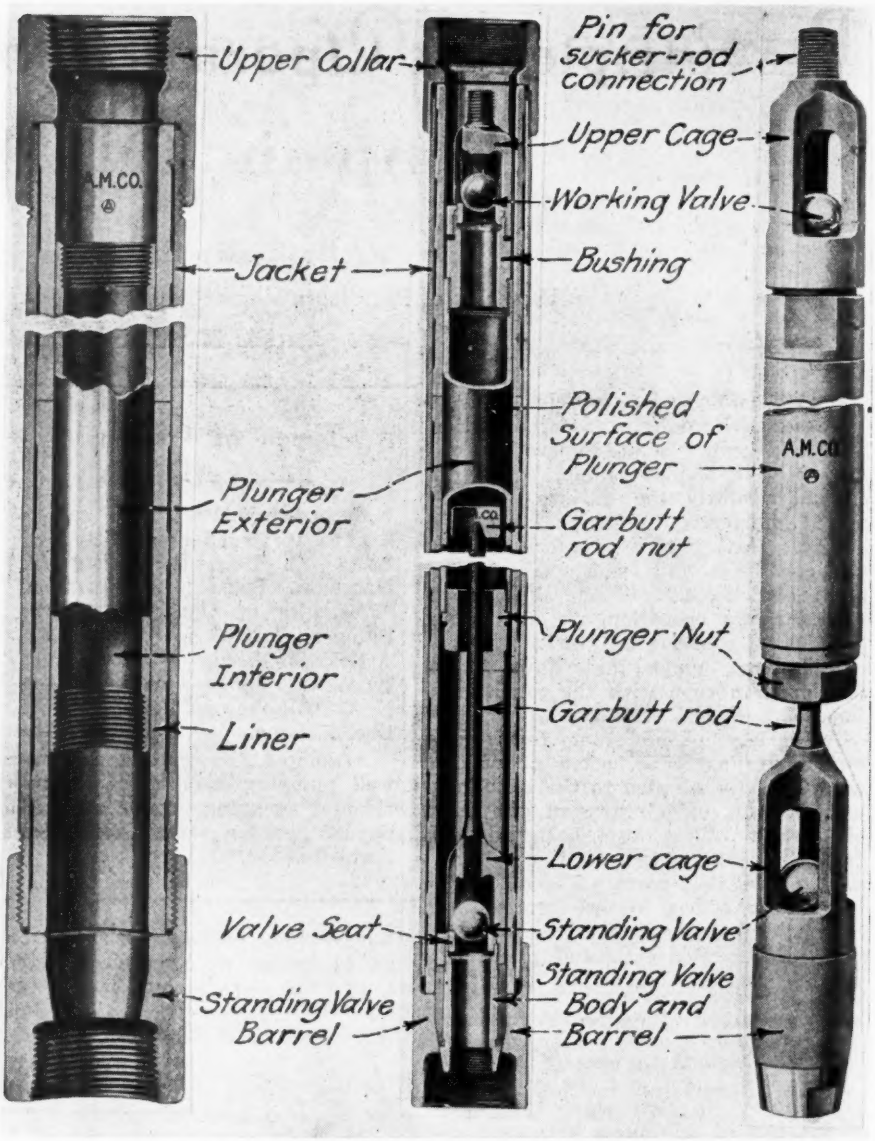


Fig. 2—Typical steel-plunger type of plunger pump, with sectional liner and Garbutt rod Attachment

Plungers

PLUNGERS may be had from the manufacturers in "follow-up" sizes, so that wear in the working barrel may be compensated by substituting a new plunger of slightly greater diameter than the old, thus maintaining an approximately constant clearance. One manufacturer lists as many as 14 different diameters of plungers for each standard size of pump, each differing from the larger and smaller sizes in the series by about one-thousandth of an inch. The wide variety of sizes also permits of selection of plungers to provide any desired clearance thought to be necessary in contending with abnormally high fluid pressures or ground temperatures.

In order to compensate for inequalities in the bore of the working barrel, occasioned by wear or otherwise, some pump plungers are equipped with spring-actuated rings similar to those used on automobile engine pistons. Plunger rings apparently function satisfactorily in maintaining a fluid seal between the plunger and the barrel, but represent an additional complication in pump design and construction that is unnecessary if plungers and barrels are accurately fitted, and if abnormal wear can be prevented by efficient sand exclusion.

Fig. 3—Section of typical cast-iron working-barrel liner

Another method of reducing slippage losses involves the use of a corrugated plunger. It is claimed that expansion of oil in the clearance space between the plunger and the barrel, into the free spaces provided by these corrugations, reduces plunger leakage; however, the grooves are said to accumulate sand, which scores the polished surface of the barrel.[1]

A type of plunger preferred by

1. Sargent, S. B., Jr., "The Theory of Pump Design and Practical Application of Various Types", Oil-Field Engineering, Oct. 1927, pp. 47-54.

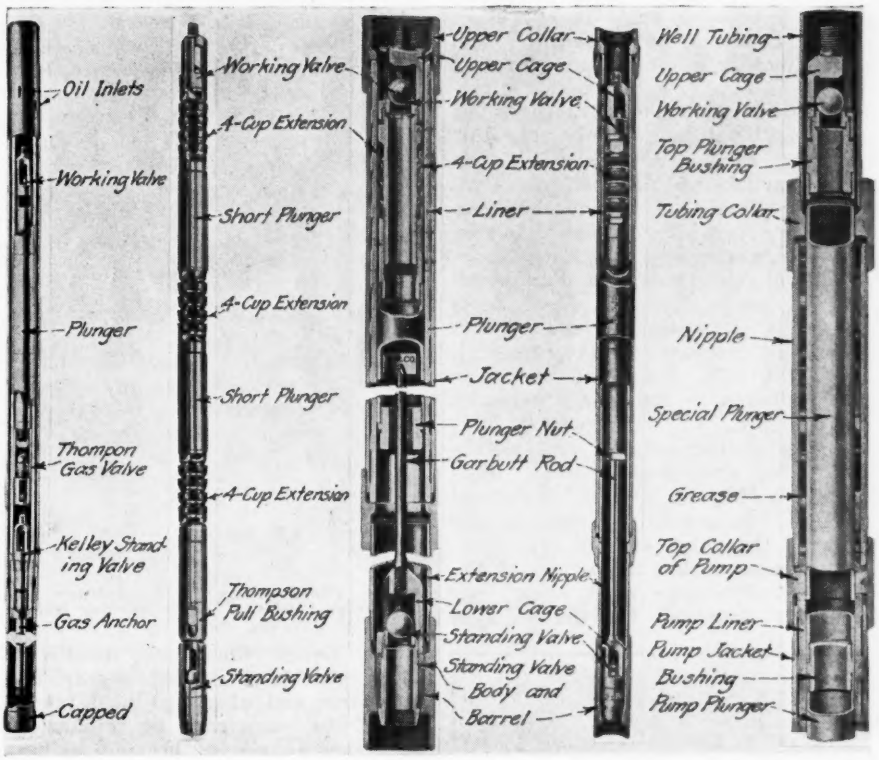


Fig. 4—C & W working barrel (D & W Pump Co.) *Fig. 5—Multiple plungers* *Fig. 6—Types of plunger pumps with cup extensions* *Fig. 7—Grease-packed upper plunger extension (Axleson Machine Co.)*

some operators is made up of two or more short plungers connected by steel plunger extensions carrying leather cups—the so-called "combination" or "multiple" plunger. (See Figure 5.) Such an assembly, it is claimed, adapts itself better to irregularities in the bore of the working barrel—if such exist—and the intermediate cups serve to pick up and absorb any sand that may find its way in between the plunger and the barrel, thus reducing the scoring action on the polished surfaces. A plunger extension, equipped with cups, is frequently used on the top, and occasionally also on both the top and bottom of long steel plungers as a means of protecting the polished surfaces of the plunger and barrel against sand scoring. (See Figure 6.) Leather cups should preferably be protected by steel "followers" to prevent their distortion under high fluid pressures. Sulphur in oil will destroy leather cups in a short time, so that they must be frequently replaced. "Composition" cups are superior in this respect.

Working Barrel Extensions

MANY producers prefer a type of pump in which the standing valve, instead of being supported in the lower end of the working barrel, is placed in a special extension shoe connected with the lower collar of the working barrel by a short nipple. (See Figure 6.) Such an arrangement leaves the full length of the working barrel available for motion of the plunger, and sand which may show a tendency to accumulate about the standing valve does not so readily find its way into the working barrel. The extension tubing should be slightly larger in internal diameter than that of the working barrel, so that the lower end of the plunger may extend below the lower collar of the working barrel without being abraded by the inner surface of the nipple.

Fig. 10—Standing-valve barrel

The use of an upper extension working barrel, somewhat larger in internal diameter than the working barrel and filled with grease, as a protection against sand finding its way down between the polished surfaces of the plunger and working barrel, was mentioned in the previous article of this series. The upper extension, grease-filled plunger is illustrated in Figure 7.

Standing valves consist ordinarily

Fig. 8—Ball and seat

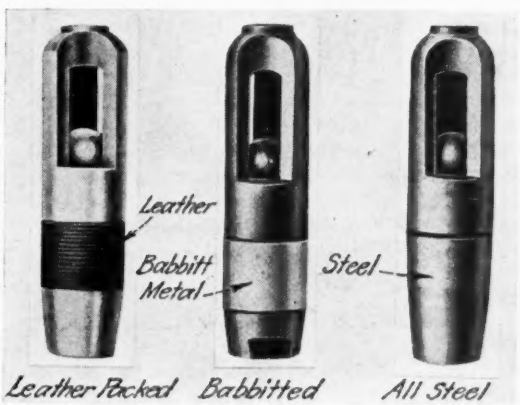


Fig. 9—At left—Types of standing-valve bodies

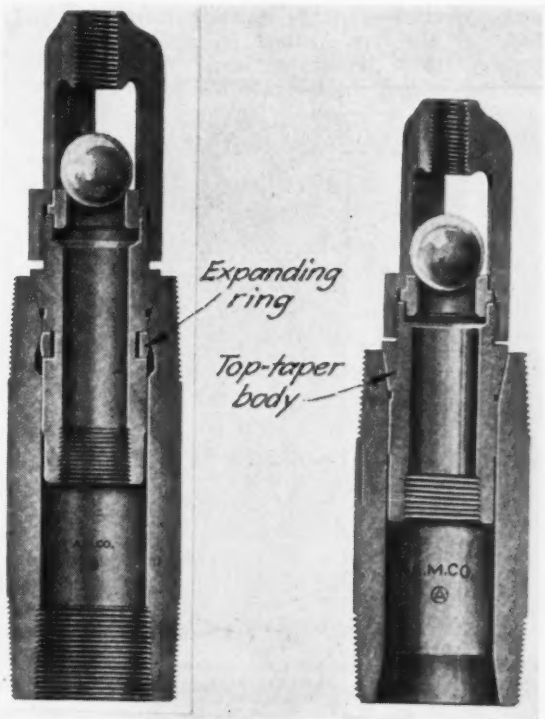


Fig. 11—At right—Ritter standing valve (Axelson Machine Co.) *Fig. 12—Kelly standing valve*

of steel, brass or bronze balls with reversible seats of the same material, accurately shaped and ground together to ensure security against all leakage. (See Figure 8.) The seat is mounted in a steel standing valve body which, however, is often surfaced with Babbitt metal or leather packing rings (See Figure 9) to pro-

Fig. 13—Plumb-bob valve and "mixer" seat. (D & B Pump Co.)

vide a frictional hold on the inner surface of the standing valve barrel. (See Figure 10.) The soft metal or leather packing is shaped to snugly fit within the barrel, and takes a friction hold when the standing valve is pressed into the barrel by the downward pressure of the plunger and sucker rods. The frictional hold of the valve body in its barrel must be sufficient to prevent it from being dislodged by upward pressure of the oil and by the jarring action of the plunger.

Closeness of fit of the standing valve in its barrel, is also essential in preventing leakage of oil around the valve body during the down-stroke of the plunger.

The Ritter standing valve, illustrated in Figure 11, is equipped with a lock-ring, which expands into a tapered groove in the standing valve barrel, a device which assists in holding the valve in position, yet does not prevent its ready withdrawal when desired. The Kelly standing valve, illustrated in Figure 12, has the tapered portion of the standing-valve body at the top instead of at the bottom, thus preventing sand from packing around the body. The lower

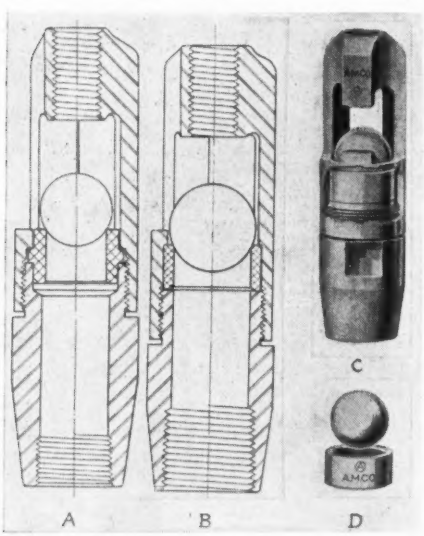


Fig. 14—Over-size standing valve (Axelson Machine Co.) Form of valve and seat is shown at D, and sectionalized assembly view at C. Sectionalized drawing B may be contrasted with usual form of standing valve shown at A

portion acts as a guide in seating.

The disadvantages resulting from restrictions in the cross-section of the oil-flow channel at the standing valve, and the advantages of "over-size" valves in minimizing this difficulty, have been discussed in an earlier article of this series.[2] Construction details of a typical standing valve providing higher-than-normal cross-sectional areas for passage of oil, are illustrated in Figure 14. This is accomplished in most cases by special features of design which permit of the use of a larger ball than that with which the particular size of pump in use would normally be equipped. In some cases, however, as in the case of the plumb-bob valve and "mixer" seat, illustrated in Figure 13, it is realized through fundamental changes in the form of the valve and its seat.

The space within the wings of the standing-valve cage must allow only moderate clearance for the ball, in

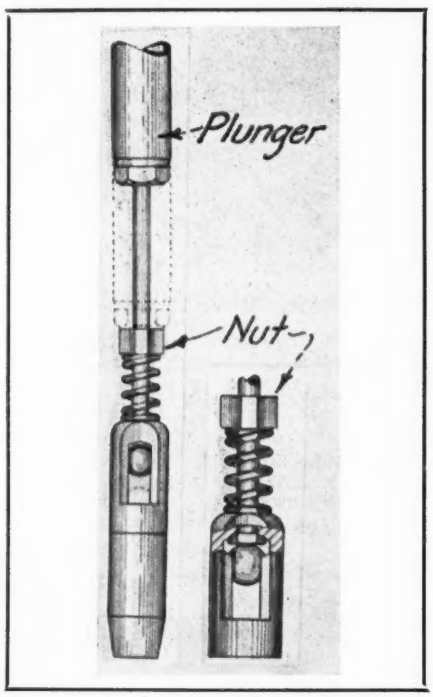


Fig. 15—Abbott valve-releasing attachment. (D & B Pump Co.)

order to insure proper seating, and yet must permit the ball to rise and fall freely. The surface of contact of the wings with the ball should be as small as is consistent with strength and service, in order to minimize the tendency of the ball to adhere to the wings.

This tendency is at times a source of inefficiency, particularly if water-saturated clay or sand finds its way into the pump. In the event that the standing valve ceases to function, due to this cause, rapid operation of the pump may free the valve of the adhering substance, or light jarring down with the lower end of the plunger on the top of the standing-valve cage may assist.

2. See NATIONAL PETROLEUM NEWS, issue of October 26, 1927, pp. 67-75.

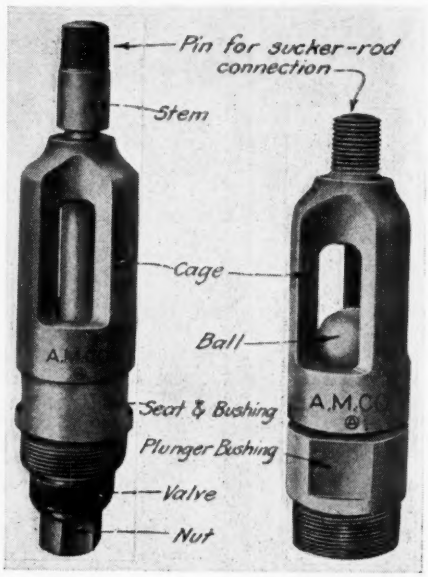


Fig. 16—Positive action working valve

Fig. 17—Standard type of working valve

The device illustrated in Figure 15 is constructed in such a way that the lower end of a rod held in the top of the valve cage by the tension of a spring, may be brought to bear directly in loosening the valve when it becomes suspended above its seat. If the position of the plunger is properly adjusted, the bottom plunger nut strikes the nut on the rod above the spring at the end of each down stroke, forcing the lower end of the rod down into the upper portion of the cage.

If the valve sticks, it is thus dislodged, but as long as it seats properly, its normal functioning is not interfered with. The device may also be adjusted to function in a similar way on the working valve.

THE working valve is customarily also of the simple ball and reversible-seat type, the seat being mounted in a plunger bushing of suitable form, generally screwed to the top of the plunger, while the valve is held in position over the seat by

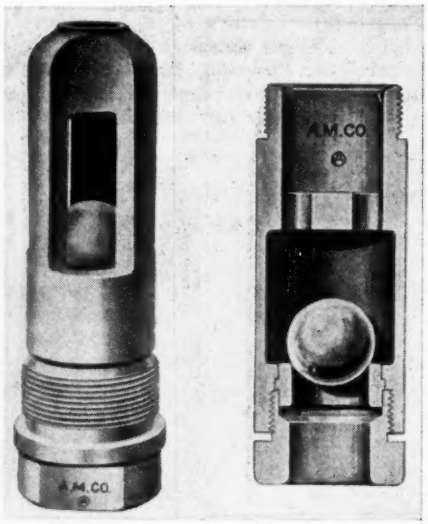


Fig. 18—Types of bottom-plunger working valves

a cage having a threaded connection for screwing into a sucker rod coupling or box (see Figures 2 and 17). The "positive action" working valve, especially recommended for the pumping of heavy oils and sandy conditions, offers an interesting variation in design (see Figure 16). In this, the valve is mounted on a vertical stem below the seat, the downward displacement of the valve from its seat being limited by a shoulder above the cage on tne upper part of the stem.

The difficulties resulting from segregation of gas from the oil between the working and standing valves, have been explained in the preceding article of this series.[3] These difficulties can be partially remedied by placing the working valves in the lower end of the plunger instead of at the upper end. The volume of suction space between the valves is thereby greatly decreased. Types of valves and plunger designs in which this objective is sought, are illustrated in Figures 18 and 19.

When a bottom plunger valve is used it becomes impractical to use the Garbutt rod attachment for pulling the standing valve. In its stead, one or another of several different types of standing valve pulling devices must be used. (See Figures 19 and 20.) These provide attachments on the lower end of the plunger and top of the standing valve cage, which engage when the plunger is lowered on the standing valve and turned.

In another design, planned to reduce the suction volume between the standing and working valves by reducing the distance between the valves, the standing valve is mounted on an extension tube above the standing-valve barrel, so that it projects up inside of the plunger (see Figure 21). Two standing valves are sometimes used, one in its normal position in the lower standing valve body, and the other above in the upper end of the extension tube, within the plunger. The lower end of the plunger engages the upper standing valve bushing when it is withdrawn, so that the device also performs the function of a Garbutt rod.

Part II of Article 3 in this series will be published in NATIONAL PETROLEUM NEWS, issue of Dec. 7.

3. See NATIONAL PETROLEUM NEWS, issue of November 9, 1927, pp. 65-86.

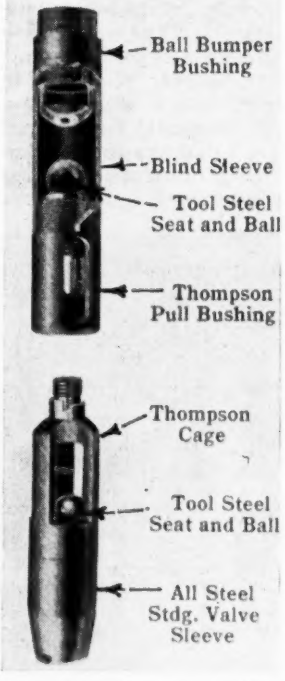


Fig. 19—Thompson bottom-plunger valve and standing valve pulling attachment (D & B Pump Co.)

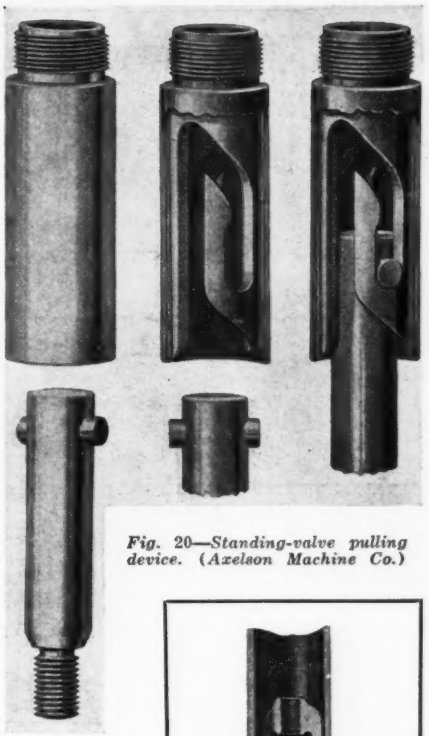


Fig. 20—Standing-valve pulling device. (Axelson Machine Co.)

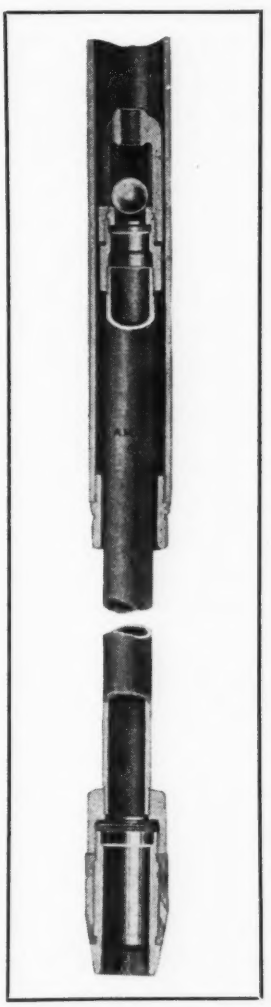


Fig. 21—Showing standing valves in plunger on extension tube

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Committee Reports on Quality of Natural Gasoline Made in California

By R. W. Garman*

Presented at meeting of California Natural Gasoline Association, Nov. 15, 1927. Mr. Garman is chairman of the specifications committee of the association, which prepared the paper.

IT IS scarcely necessary to mention the history of natural gasoline manufacture, except to state that, by the very nature of its springing into existence intermediate between the oil producer and the oil refiner, it has occupied a position where, in addition to striving for a solution of its own problems of manufacture, it must work hand in hand with the oil producer as regards the handling of natural gas, and must likewise look to the oil refiner for a market.

In California it happens that a very large percentage of the natural gasoline is manufactured by oil companies which produce the gas from which the gasoline is extracted and which likewise operates refineries, so that this state has been somewhat exempt from some of the Mid-Continent problems. In the last few years, however, the industry has grown somewhat out of this stage to the point where there is now considerable bartering of natural gasoline. It is therefore the object of this paper to deal more with the relation between the natural gasoline manufacturer and the refiner insofar as the quality of natural gasoline is concerned.

Up to the present date there has been no survey of California natural gasoline as to quality. In fact it is only rather recently that the first surveys as to quantity were carried out. The California Natural Gasoline Association has naturally become quite curious as to just what various commodities are being handled in the state under the name of natural gasoline, and a committee was therefore appointed to study the situation.

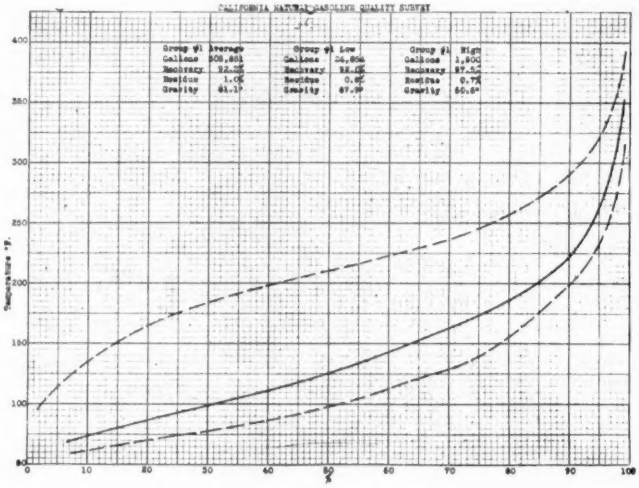
Now, by reason of the whole-hearted support of the natural gasoline manufacturers in submitting to the committee the results of Engler distillations of the product from separate plants, we are ready to submit a report which is really only of a preliminary nature.

This report is chiefly a comparison of Engler results. No attempt has been made to analyze various natural gasolines into the various hydrocarbons. In order to make intelligent comparisons it was necessary arbitrarily to classify into five groups according to distillation recovery, 90 per cent or more, 85 to 89.9 per cent, 80 to 84.9 per cent, 75 to 79.9 per cent and 74.9 per cent or less. It should be understood that this grouping is not a classification proposal. It is used only for the purpose of present study.

Before proceeding further it should be stated that, although the recognized method No. D 216-25T A. S. T. M. was specified for all natural gasoline manufacturers to use in making out their reports, there are undoubtedly many errors in those reports.

For instance, samples were not secured at tank pressures in many cases, and such weathered gasoline will show better recovery than is really true. Otherwise, we believe the great majority of samples were taken in a proper manner, and that reports from a large number of plants will compensate a number of errors. It should now be mentioned that the reports cover a daily production of approximately 1,225,000 gal-

*Union Oil Co. of California.



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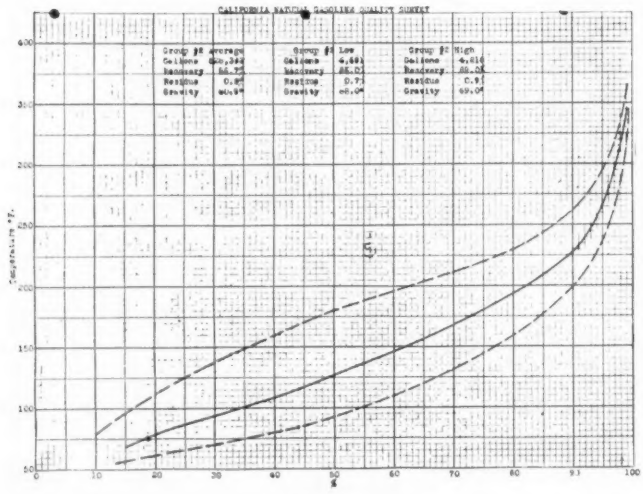

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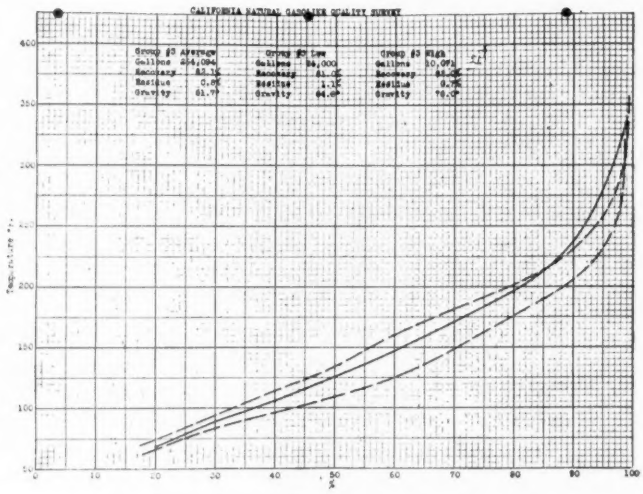

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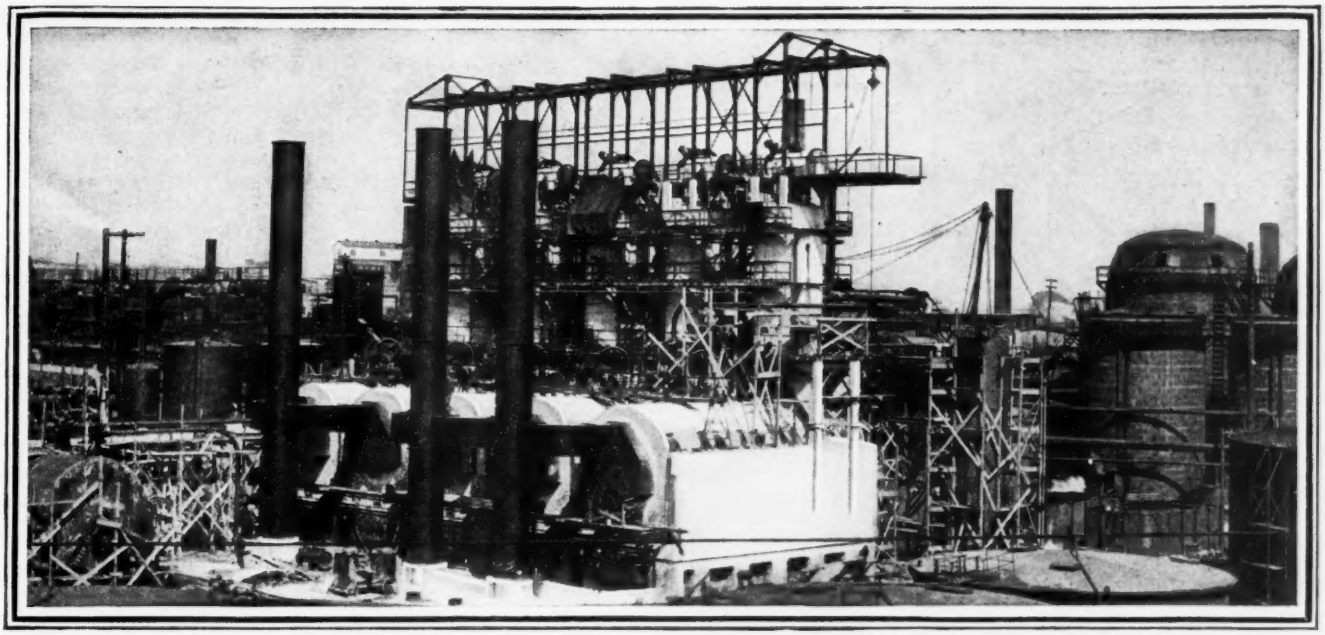

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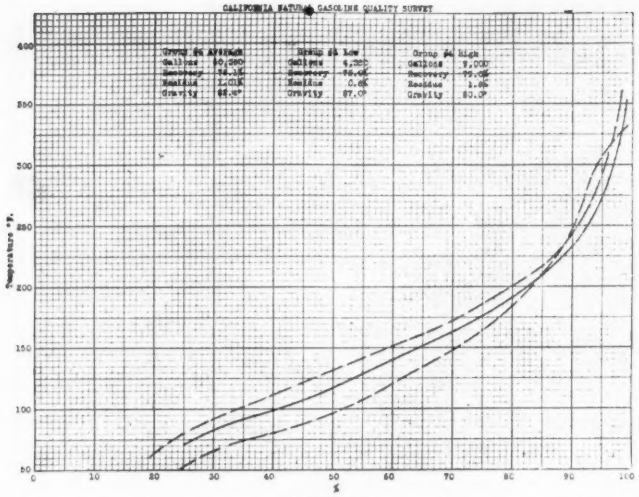

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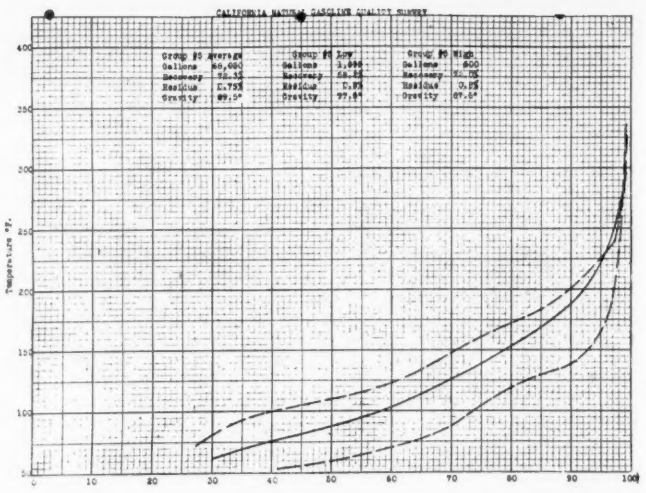


Sheet 5

lons which represents about 90 per cent of the total state production.

Procedure in comparison of Engler results was: first, to plot Engler results for each of 104 gasoline plants; second, to group the results according to recovery, and then obtain weighted average curves for each group, showing also maximum and minimum curves of individual plants; third, obtain weighted average curve overall; and fourth, obtain recovery-gravity curve from group averages.

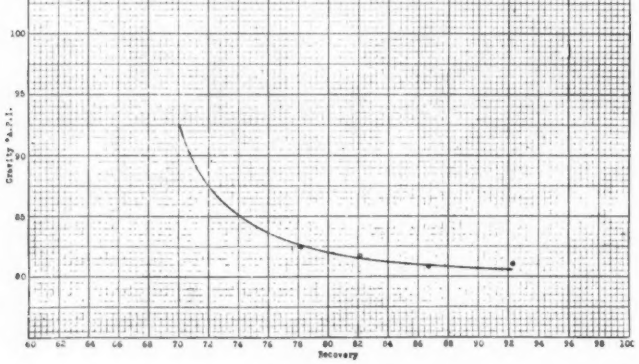
THE first sheet shows the weighted average curve for Group 1, recovery 90 per cent or over. It might be well to say a few words here as to our method of plotting curves. The reverse method was used on the data from each plant, the residue percentage first being deducted from 100 per cent. The distillation loss, therefore, shows at the left end. In order to obtain the weighted average readings, each curve after being once plotted was re-read directly on the 10, 20, 30, 40, 50, 60, 70, 80, 90 and 98 per cent lines of the curve sheet. The readings from the various individual plant curves were weighted according to gallonage. Weighted average recovery, residue, and gravity were obtained in a similar manner, gravity A. P. I., of course, being changed to specific gravity in the meantime.

Referring again to this curve sheet, it will first be noted that the average falls much more closely to the minimum than to the maximum. In other words, the bulk of natural gasoline is nearer the lower line. It might be noted that the lower curve, which represents the output of an individual plant, might be said by some authorities to represent the best natural gasoline in California.

The 10 per cent point of this lower curve as read from divisions on the sheet itself is 61; the 60 per cent point is 113; and the end point is 316; the recovery being 92.0 per cent; residue 0.8 per cent; and the gravity 87.9. Taking the upper curve, the 10 per cent point is 135; the 60 per cent is 223; and the end point is 393; the recovery being 97.5 per cent; residue 0.7 per cent; and gravity 60.6. Readings from the average curve are 10 per cent, 74; 60 per cent, 143; and end point, 353; the recovery being 92.3 per cent; residue 1.0 per cent; and gravity 81.1. Group 1, recovery 90 per cent or more, represents about 25 per cent of the natural gasoline reported and includes the product from 25 of the 104 gasoline plants reported.

The second sheet shows the weighted average curve for Group 2, recovery 85 to 89.9 per cent. In this case the average is only slightly closer to the lower curve than to the upper. In other words the various gasolines in this group are rather evenly distributed between the two extremes. Reading on the lower curve, the 15 per cent point is 57, the 60 per cent point is 110, and the end point 345, the recovery being 86.0 per cent, residue 0.7 per cent and the gravity 88.0. Taking the upper curve, the 15 per cent point is 96, the 60 per cent is 195, and the end point, 365, the recovery being 89.0 per cent, residue 0.9 per cent, and gravity 69.0. The average curve reads: 15 per cent, 69; 60 per cent, 146; and end point, 325; the recovery being 86.7 per cent; residue 0.8 per cent; and gravity 80.9. Group 2, recovery 85 to 89.9 per cent, represents about 43 per cent of the natural gasoline reported and includes the product from 49 of the 104 gasoline plants.

The third sheet shows the weighted average curve for Group 3, recovery 80 to 84.9. It will be noted that the upper and lower curves indicate a



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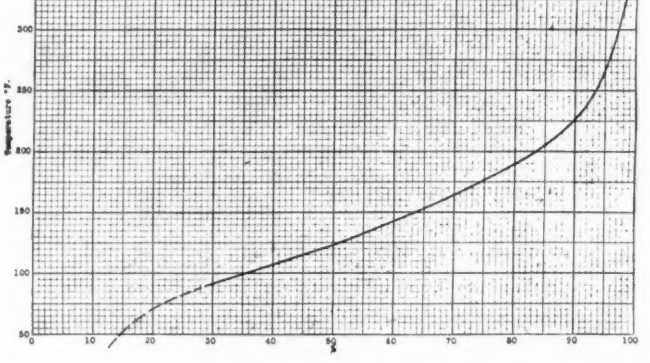


Sheet 7

rather narrow range. The average curve reads: 20 per cent, 69; 60 per cent, 147; and end point, 340; the recovery being 82.1 per cent; residue 0.8 per cent; and gravity, 87.7. This group represents 22 per cent of the natural gasoline reported and includes the product from 18 plants.

The fourth sheet shows the weighted average curve for Group 4, recovery 75 to 79.9 per cent. It reads: 25 per cent, 71; 60 per cent, 140; and end point, 353; the recovery being 78.1 per cent; residue 1.01 per cent; and gravity, 82.4. This group represents 5 per cent of the natural gasoline reported and includes the product from 5 plants.

The fifth sheet shows the weighted average curve for Group 5, recovery below 74.9 per cent. It reads: 30 per cent, 61; 60 per cent, 103; and end point, 296; the recovery being 72.3, residue 0.75 per cent; and gravity, 89.5. The gasoline here represented is 5 per cent of the total, and it is produced from 7 plants.

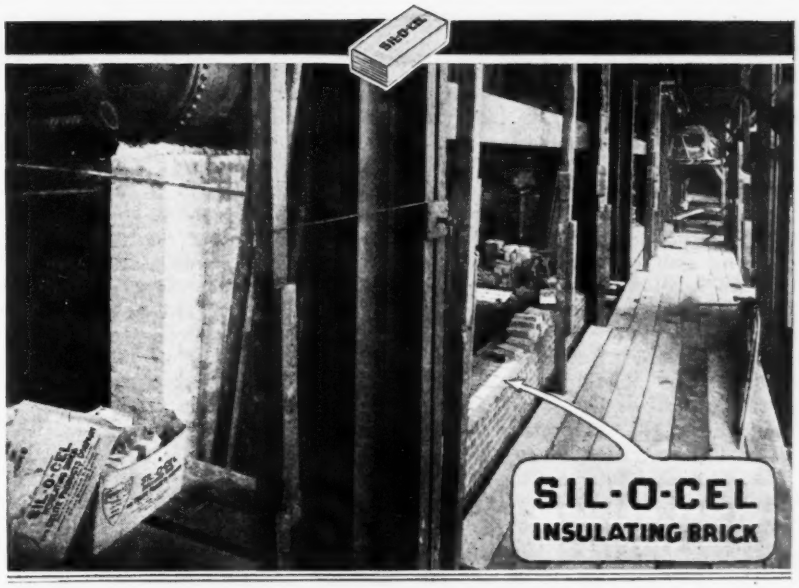
BEFORE making a grand average of the five average curves, Sheet 6 shows the relation between the average recovery and average gravity of the five groups. It would be expected that gravity A. P. I. should decrease as the distillation recovery increases. In general such is the case, but the curve shows that a large portion of the high recovery gasoline has been carefully made and a comparatively high gravity maintained.

However, this curve should not be taken too seriously, and is merely inserted as a general indication of the relation between recovery and gravity.

The seventh and final sheet shows a grand average curve of all California natural gasoline. This curve means that half the Engler readings on California natural gasoline fall below it and half above. The 30 per cent point on this grand average curve reads 91, the 60 per cent, 143, and the end point 354, the recovery being 86.8 per cent; the residue 0.8 per cent; and the gravity, 81.6° A. P. I.

A few comments might now be made. The ordinary conception of the natural gasoline user, usually the refiner, is that natural gasoline should be used as a blend with his refinery stock to raise the gravity, and he probably concedes that the higher the gravity the better the natural gasoline. Now this conception may be technically incorrect and the refiner may actually be purchasing volatility, but we arrive at the same answer. The lower Engler curves represent volatility and the natural gasoline with such curves is high gravity. We can therefore say that the refiner really wants a natural gasoline with a low Engler curve, provided always that he can handle such gasoline without loss.

Although the refiner actually wants such a natural gasoline,



A boiler furnace wall under construction in an Ohio refinery. Note the Sil-O-Cel brick between the firebrick and the outer course of red brick. Ballard, Sprague & Company, Inc., engineers and contractors.

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he is forced to make a very important reservation when he accepts such material. More often than not, such natural gasoline has so high a vapor pressure that large losses, both quantitative and qualitative, are incurred before the blend is effected. Moreover, in California it happens at times that some of the large companies who treat their gas themselves have an excess of natural gasoline, and, since there is no market for such excess, there is an involuntary weathering of some sort either before or after the blend.

It seems obvious in such cases that the weathering should properly be done at the gasoline plants and should be controlled. On the other hand, there have been times when the refiner could not obtain sufficient natural gasoline. In such cases the refiner can use very low recovery natural gasoline if it is shipped by pipe line and can be properly handled under pressure at the refinery until the blend is made.

The substance of these remarks is that the refiner wants just as volatile material as he can handle without loss. As conditions change, the degree of permissible volatility should change. This can be done after a fashion by specifying the distillation recovery, but distillation recovery may not always be a reliable index of the volatility or vapor pressure.

Thus far the refiner's viewpoint has been considered, but the natural gasoline manufacturer has a decided viewpoint of his own, which is to make as great a quantity as possible, particularly when, as in California, there is usually no differential in price between high and low vapor pressure product. Ordinarily, the manufacturer suffers a large quantity loss when he is required to meet 90 per cent recovery. Proper fractionation of the product would seem to be the answer but in the past the cost of such fractionation, all things considered, has often been deemed greater than the loss without rectification or so-called stabilization.

CALIFORNIA conditions at present seem to be this: Refiners in general face an excess supply of natural gasoline; they therefore demand high distillation recovery in order to minimize losses. Natural gasoline manufacturers in turn must meet the arbitrary specification and suffer quantity loss. Finally, by reason of the arbitrary specification of high recovery by the refiner, there is likely to be an economic loss to the industry as a whole by reason of rejecting hydrocarbons which, under certain conditions, could be used as constituents of commercial gasoline.

There has been some agitation to include in specifications a limit on the Engler reading at 50 per cent. In most cases it was not stated how the curve should be plotted, something which has an important bearing on the matter. It is suggested that, where such specifications are considered necessary, reverse plotting and the 60 per cent point be used. Usually the refiner is protected by a lower limit on gravity, so that this 60 per cent reading scarcely need be specified. However, there may be some freak natural gasoline, such as that produced at re-treating plants where a blending material may be used, in which case the purchaser might consider it necessary to specify the 60 per cent point and the gravity both.

Let us take the refiner's viewpoint again. It is usually considered necessary for him to place on the market a commercial product which should have a true vapor pressure slightly below atmospheric pressure at the prevailing temperature at the delivery point. Let us say he knows the true vapor pressure of his straight refined product and the quantity thereof.

NOW if he is committed to accept a certain quantity of natural gasoline, it should be comparatively easy for him to specify just what true vapor pressure this natural gasoline should have, such that he can use it without loss before or after blend, presuming he has pipe line delivery and receives it in pressure tanks.

It should be mentioned that pipe line delivery in California is now the rule rather than the exception. In the event that other than pipe line delivery is used, the permissible vapor pressure is probably much more limited. It might be argued that when the refiner specifies vapor pressure limits he may not reach the desired gravity with his blend, but he should specify the lower limit on natural gasoline gravity. This method of specifying vapor pressure of natural gasoline from day to day should result in a minimum loss.

It is really the chief point of interest from the refiner's viewpoint, except that, as already suggested, he should not accept unnecessarily heavy natural gasoline, or should arrange prices accordingly.

Now if the refiner adopted such rules, the natural gasoline manufacturer would immediately endeavor to make as large a quantity as possible and yet meet the required vapor pressure, and would probably resort to the degree of rectification which he considered economically feasible.

This increase in quantity would tend towards another unbalanced condition, but probably would not be of sufficient degree to be serious, and would after all tend more nearly towards the refiner's requirements in supplying him with low boiling point material, excessively low boiling points being eliminated when necessary.

But to date there seems to be no recognized method of obtaining true vapor pressure of natural gasoline as manufactured in California where high storage pressures and pipe line deliveries are usually the rule. However, we have hopes that this difficulty can be surmounted.

To summarize, we have given a brief statistical report on California natural gasoline on the basis of Engler curves. We trust that this will inform those interested in natural gasoline what sort of gasoline is available, and furthermore where quality improvements without too great quantity sacrifice may be possible in the future.

AT PRESENT we make one specific recommendation:—all samples for Engler distillation should be taken at the tank pressure existing at point of sale by means of two connections to the tank, and should be carefully refrigerated to 34 degrees Fahr. before transfer to the Engler flask. We also suggest that when refiners wish to limit the Engler curve at a midpoint, they use a 60 per cent reading on reverse-plotted curves. Finally, the results of experimental work in obtaining true vapor pressure of natural gasoline at sales delivery point will be awaited with interest, the outcome to determine further work of this committee.

It may be possible at some later date to recommend that vapor pressure and gravity be the only governing factors necessary; other qualifications, such as color, corrosion test, doctor test, and end point, to hold in all cases. A distillation test more adaptable to natural gasoline may also be developed.

Gas Engine Manufacturers Form Trade Society

CLEVELAND, Nov. 28.—Manufacturers of internal combustion engines serving oil fields and the general industrial field have formed The Society for the Development of Internal Combustion Power. Attendance was large at the organization meeting in Cleveland Nov. 16 and 17.

Officers for the coming year are: president, C. F. Fithian, Bessemer Gas Engine Co., Grove City, Pa.; first vice-chairman, D. R. Shouvlin, Superior Gas Engine Co., Springfield, O., second vice-chairman, M. J. Anderson, St. Marys Oil Engine Co., St. Charles, Mo.; secretary, H. L. Hileman, Jos. Reid Gas Engine Co., Oil City, Pa.; assistant secretary, E. P. Zeigler, Franklin Valveless Gas Engine Co., Franklin, Pa.; treasurer, C. P. Clark, Clark Bros., Olean, N. Y. Members of the executive committee will be elected at the next meeting

Papers were read at the organization meeting, several dealing with oil subjects.

Harry Botsford, of the Botsford Advertising Agency, will be in charge of the society's offices at Titusville, Pa.

Denver Agrees With East That Stations Have Bulk of Oil Sales

By E. L. Barringer

N. P. N. STAFF WRITER

CONCLUSIONS as to the importance of the oil marketing business and the relation of the gasoline and oil business to other lines of retail endeavor arrived at in Baltimore and Syracuse are substantiated now by a third city, Denver, in the nation-wide survey of retail distribution for 1926 made by the U. S. Department of Domestic Commerce.

The Denver report emphasizes the point that the bulk of gasoline and oil sold to the public passes through gasoline stations. The analysis shows that of $9,884,000 spent in Denver in 1926 for gasoline and oil, 98.55 per cent was bought from oil company stations, 0.55 per cent from the automobile classification, and 0.44 per cent each from auto accessories and the unclassified division. In dollars and cents this amounts to $9,740,500 for oil companies as against $57,000 for gasoline and oil through automobile establishments, $43,400 through auto accessory stores and $43,100 through unclassified outlets. In Baltimore oil companies sold 97.25 per cent of the total gasoline and oil, and in Syracuse 96.61 per cent.

In Denver, as in Baltimore and Syracuse, gasoline and oil was the principal commodity sold at oil company stations. Petroleum products brought in $9,740,500 in 1926, while auto parts and accessories brought in $185,800. In other words of the total sales of $9,926,300, gasoline and oil accounted for 98.1 per cent and auto parts for 1.9 per cent.

The Denver survey was conducted similar to those in Baltimore and Syracuse. There were 46 classifications of retail business, one being gasoline and oil. A retail outlet was classified according to the product bringing in the largest amount of revenue last year. Statistics were tabulated on a basis of the kind of business, and on commodities.

An analysis of the Baltimore survey was published in the Nov. 9 issue of NATIONAL PETROLEUM NEWS and that of Syracuse in the Nov. 16 issue. Other cities which have been surveyed are Atlanta, Chicago, Fargo, Kansas City, Providence, San Francisco, Seattle and Springfield, Ill. Tabulations will be made by the U. S. Chamber of Commerce. These surveys will be analyzed by NATIONAL PETROLEUM NEWS as soon as tabulations are issued.

Denver, with a population of 285,000 as of July 1, 1926, from estimates of the census bureau, had

CLASSIFICATION OF RETAIL BUSINESS IN DENVER IN 1926

This table includes oil products and statistics on total sales, persons employed, wages and inventory as shown in special census report of U. S. Department of Domestic Commerce.

Kind of Business	Number of Establishments	Net Sales	Per cent of Total Sales	Persons Engaged and Wages: Employes	Firm Members and Proprietors	Total	Salaries and Wages*	Inventory† Average for Year
Art and Antique	21	$ 301,200	.19	32	20	52	$ 31,600	$ 77,100
Auto Accessories	151	3,957,700	2.54	275	156	431	379,500	643,000
Automobiles	57	10,641,300	6.84	413	31	444	766,900	1,338,400
Bakeries	102	1,197,800	.77	177	100	277	170,600	32,300
Boot and Shoe	55	2,589,900	1.66	217	38	255	313,600	819,000
Building Materials	75	5,040,900	3.24	430	35	465	685,900	993,000
Candy and Confectionery	169	1,408,300	.90	208	181	389	172,200	71,400
Undertakers Supplies	12	597,700	.38	30	9	39	58,500	50,000
Cigars and Tobacco	126	1,202,900	.77	103	131	234	96,100	136,900
Clothing, Women's	39	5,698,300	3.67	535	32	567	699,900	691,800
Clothing and Furnishings, Men's	134	4,239,700	2.72	309	135	444	482,900	2,396,100
Custom Tailors	69	772,200	.50	140	72	212	163,400	141,600
Coal, Wood and Ice	71	4,810,400	3.09	341	64	405	453,400	170,300
Dairy and Poultry Products	31	492,700	.32	36	33	69	40,500	30,300
Department	6	25,538,700	16.41	3,827	...	3,827	4,621,700	5,839,100
Drug	242	6,807,600	4.37	759	230	989	968,200	1,143,700
Dry Goods and Notions	122	3,728,300	2.39	323	126	449	480,900	963,700
Electrical Appliances	39	2,383,300	1.53	316	37	353	628,800	407,400
Five and Ten Cent Stores	5	2,008,700	1.29	292	...	292	199,400	225,900
Florists	42	973,900	.63	128	45	173	168,700	98,900
Fruit and Vegetable	45	1,038,700	.67	82	48	130	84,200	32,800
Fur and Fur Clothing	14	483,500	.31	38	15	53	63,600	186,200
Housefurnishings	117	6,529,100	4.19	696	113	809	1,054,600	1,596,200
Gasoline and Oil	307	9,933,600	6.38	658	142	800	819,100	546,500
Grocery and Delicatessen	772	22,694,600	14.59	1,276	751	2,027	1,639,000	1,531,000
Hardware	89	1,792,000	1.15	157	78	235	226,400	442,500
Hats and Caps, Men's and Boys'	9	191,900	.12	15	7	22	20,500	31,600
Hay, Grain and Feed	15	774,700	.50	25	17	42	29,300	38,300
Jewelry	89	2,350,700	1.51	245	84	329	370,900	1,327,000
Junk	17	442,400	.28	24	21	45	30,500	123,500
Leather Goods	17	657,500	.42	76	15	91	79,100	176,700
Meat, Poultry and Fish	146	4,488,400	2.89	208	130	338	340,200	76,600
Millinery and Artificial Flowers	45	850,600	.55	153	38	191	154,700	85,100
Motorcycles and Bicycles	20	116,000	.07	12	21	33	11,000	27,300
Musical Instruments	21	2,253,600	1.45	172	18	190	332,300	490,900
Office Equipment and Paper	32	1,107,100	.71	179	22	201	242,300	227,600
Optical Goods	28	1,251,100	.80	97	23	120	171,700	255,100
Paint, Varnish and Glass	21	333,300	.21	25	24	49	34,500	104,800
Photographic Supplies and Cameras	13	101,800	.07	24	12	36	13,300	16,900
Plumbing and Heating Fixtures	42	893,800	.57	70	49	119	114,300	68,200
Radio	10	150,400	.10	23	10	33	17,200	40,500
Restaurants	381	10,151,800	6.52	2,453	396	2,849	2,316,400	159,000
Sporting Goods and Toys	77	174,500	.11	16	9	25	23,500	49,400
Stationery and Books	32	1,315,100	.85	203	28	231	292,000	182,100
Typewriters and Calculating Machines	9	301,500	.19	61	4	65	76,400	82,600
Unclassified	33	903,600	.58	73	37	110	72,000	168,100
Total	3,899	$155,672,800	100.00	15,952	3,587	19,539	$20,211,700	$24,336,400

*Exclusive of compensation or earnings of Proprietors and Firm Members.
†At Cost.

Fig. 106
Screwed, Jenkins Standard Bronze Globe Valve

The staying qualities of a Jenkins Valve

The staying qualities of a Jenkins Valve are well-known to engineers who use Jenkins by the hundred, and who standardize on them. There are not a few instances of Jenkins Valves which have served for thirty, for thirty-five, and even for forty years and over, valves still on the job today.

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Fig. 108
Screwed, Jenkins Standard Bronze Angle Valve

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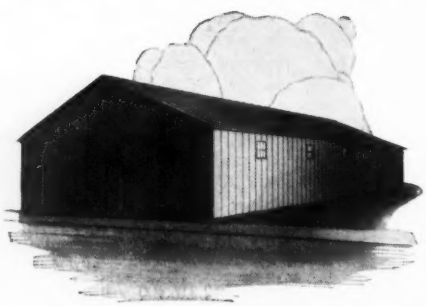

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Table No. 1

Average sales per establishment for various kinds of retail business in Denver for 1926:

Department	$4,256,450
Five & Ten Cent	401,740
Automobile	186,689
Women's clothing	146,110
Musical instruments	107,314
Coal, wood & ice	67,752
Building materials	67,212
Electrical appliances	61,110
Housefurnishings	55,804
Hay, grain & feed	51,647
Undertakers	49,805
Boot & shoe	47,089
Optical goods	44,682
Stationery, magazines	41,097
Leather goods	38,676
Office equipment	34,597
Fur clothing	34,536
Typewriters, etc.	33,500
Gasoline and oil	32,357
Average for all 46 kinds of retail business	39,926

3,899 retail outlets in 1926. Sales aggregated $155,672,800. There were 558 chain store units doing a business of $30,384,500, and 3,341 independently owned outlets with $125,288,300 sales. In the gasoline and oil business there are 307 establishments listed, with net sales of $9,933,600.

IN figuring percentages with data on number of establishments net sales, average sales per outlet, number of inhabitants per outlet and sales per capita in the three cities there are some interesting figures. Syracuse had 75 retail outlets with net sales of $3,701,800; Baltimore had 221 outlets and net sales of $13,180,100. Thus, average sale per establishment in Denver was $32,357, as compared with $49,357 in Syracuse and $59,640 in Baltimore. Bringing in population there were 928 inhabitants for each Denver outlet, 2,467 in Syracuse and 3,656 in Baltimore.

The average amount of money spent for retail merchandise in Denver per inhabitant was $546.22, in Syracuse $561.14 and in Baltimore $456.72. This leads to the point that per capita gasoline and oil sales in Denver were $34.85, as against $20.01 in Syracuse and $16.31 in Baltimore. Incidentally, in this relation of sales per capita the gasoline and oil business in Denver is close to the top of the heap, outranked only by departments, grocery and delicatessen, automobile, and restaurants, in the order named. On this basis of comparison gasoline and oil ranked eighth in

Table No. 2

Sales per capita to the kind of retail business in Denver in 1926:

Department	$ 89.61
Grocery and delicatessen	79.63
Automobile	37.34
Restaurants	35.62
Gasoline and oil	34.85
Sales per capita for 46 kinds of business classifications	$546.22

Table No. 3

Retail outlets for gasoline and oil in Denver in 1926 and volume of sales where possible to ascertain:

	Number	Volume in $
Auto accessories	19	$ 43,400
Automobile	13	57,000
Building material	1	.....
Coal, ice & wood	1	.....
Gasoline & oil	307	9,740,500
Grocery & delicatessen	1	.....
Meat, poultry & fish	1	.....
Unclassified	....	43,100
Totals	342	$9,884,000

Baltimore and eleventh in Syracuse.

Denver ranks first among the three cities in number of persons engaged in the business. The total is 800; with 658 classified as employees and 142 as firm members and proprietors. Wages, not including compensation to firm members were $819,100, or 8.25 per cent of net sales. The average employee's wage was $1,245, while the average for all retail lines was $1,267. Syracuse and Baltimore average wage was above the average for all lines, and higher than that for Denver.

The yearly average inventory for all Denver outlets was $546,500 or an average of $1,780. These figures are in line with inventories of Baltimore, both cities carrying approximately 5 per cent of net sales or an approximate turnover 20 times each year. As for Syracuse, where the average per outlet inventory was given as $6,231, the Denver data is more in line with figures given by a Syracuse jobber who stated that his largest station's inventory was around $1,500.

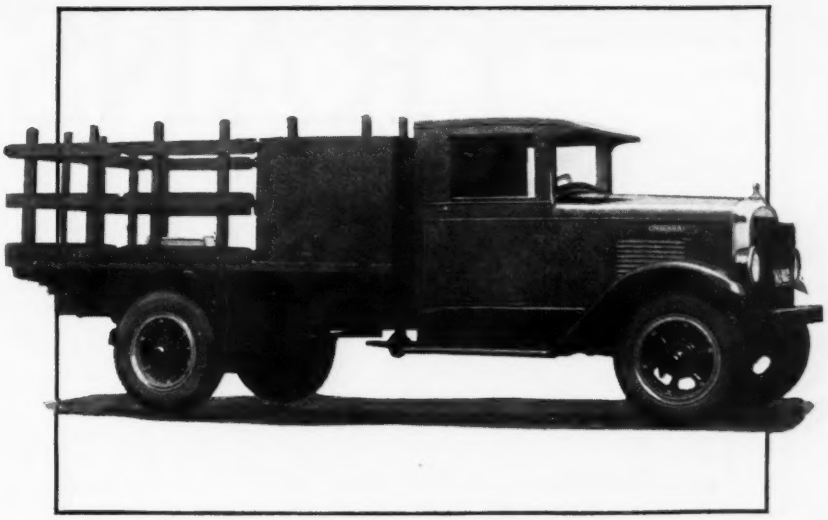
In the tabulation of the Denver retail business on a commodity basis, gasoline and oil again is near the top, ranking third out of 69 commodities. Sales amounted to $9,884,000. This is 6.35 per cent of the retail dollar, on a commodity basis.

While there were 307 establishments listing gasoline and oil as the principal sales article there were 343 places selling this goods. The gasoline and oil business headed the list with its 307 outlets; auto accessories had 19 outlets; automobile 13; and there was one each for building materials, coal, ice and wood, grocery and delicatessen, and one for meat, poultry and fish. Auto accessories did business amounting to $43,400, automobile $57,000, gasoline and oil $9,740,500, and the other outlets grouped under unclassified did $43,100 worth of business.

Table No. 4

Sales of commodities at gasoline stations in Denver in 1926:

Auto parts & accessories	$ 185,800
Gasoline & Oil	9,740,500
Total sales	$9,926,300



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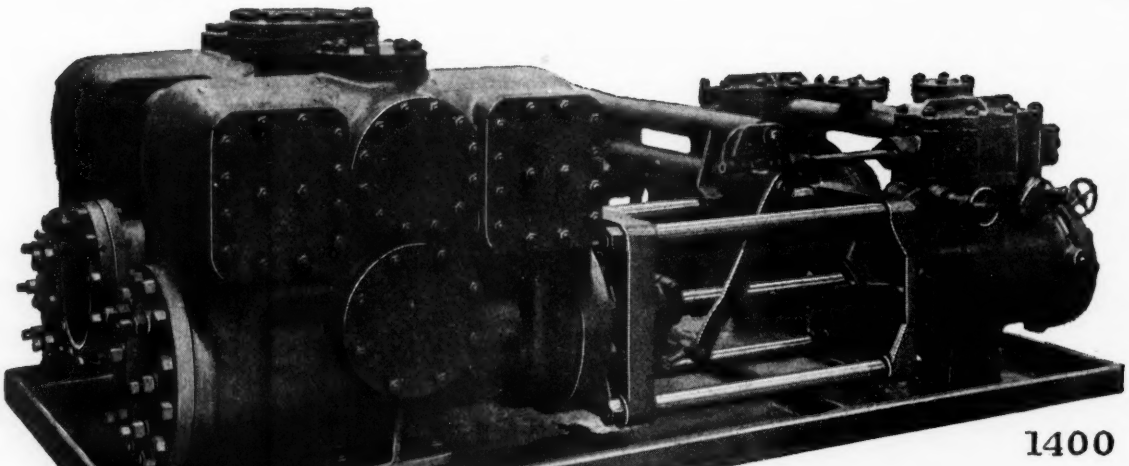

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Leamon Process Co. Uses Modified Delco Engine for Anti-Knock Testing

By W. G. Leamon*

Diverse ideas prevail among oil technologists as to the best methods for measuring and reporting the anti-knock values of various fuels. It is almost a fact that no two agree on the best methods to use or the significance of the results obtained by the various methods.

Mr. Leamon, the developer of the Stellarene vapor phase cracking process, herewith outlines the method used in the laboratories of his company in testing the relative anti-knock values of various fuels in terms of benzol equivalent, and also the equipment used.

IN GENERAL, the method employed is to operate a small single cylinder engine under standard conditions on one of the fuels undergoing test and without stopping the engine to shift to another fuel and then measure the difference in engine performance. In the final analysis it resolves itself into a fuel matching test.

Knocking (pre-ignition or detonation) is detected by sound, decrease in power and increase in gas evolved by the Midgley bouncing pin apparatus. Note that the bouncing pin is not used to quantitatively measure the degree of knocking—its function is to indicate whether or not knocking is present.

The anti-knock value of the fuel is expressed as a "benzol equivalent," that is, the amount of 90 per cent benzol that must be added to gasoline to have equal anti-knock properties. Thus if a fuel is found to resist knocking in the same degree as a mixture composed of 40 per cent motor benzol and 60 per cent gasoline, it is said to be equivalent to a "40-60" benzol-gasoline blend. The tendency of gasoline to knock varies with the source but can be grouped in two very broad classes: (1) that from the Mid-Continent fields, which is very low in knock resisting, and (2) that from certain California fields, which is approximately equal to a 30 per cent benzol-70 per cent Mid-Continent blend. *It is therefore absolutely essential to specify the gasoline used in making the reference fuel blend.* The anti-knock value is also expressed in terms of the mean effective pressure developed without knocking. Comparisons are always made to a reference test fuel, usually a benzol-gasoline blend, to eliminate the possibility of error due to change in engine condition. Measurements are made with fixed spark and several settings of the fuel metering valve to eliminate inaccuracies due to change in mixture ratio. Additional sets of readings are taken with different spark settings. Curves are then platted to graphically show the fuel characteristics.

The power developed by the engine can be determined by the measurement of voltage and amperage, by the generator efficiency.

However, as the generator efficiency does not vary greatly within the limits of test operation and as absolute quantitative measurements are not required, because comparisons are made to performance with the reference fuel, the generator efficiency can be eliminated, for sake of simplicity and power expressed as indicated watts.

A division of watts (power) by the crank speed (RPM) gives a factor proportional to the torque and as the cylinder displacement is a constant it is also proportional to the brake mean effective pressure and is referred to as the coefficient of brake mean effective pressure or MEP coefficient.

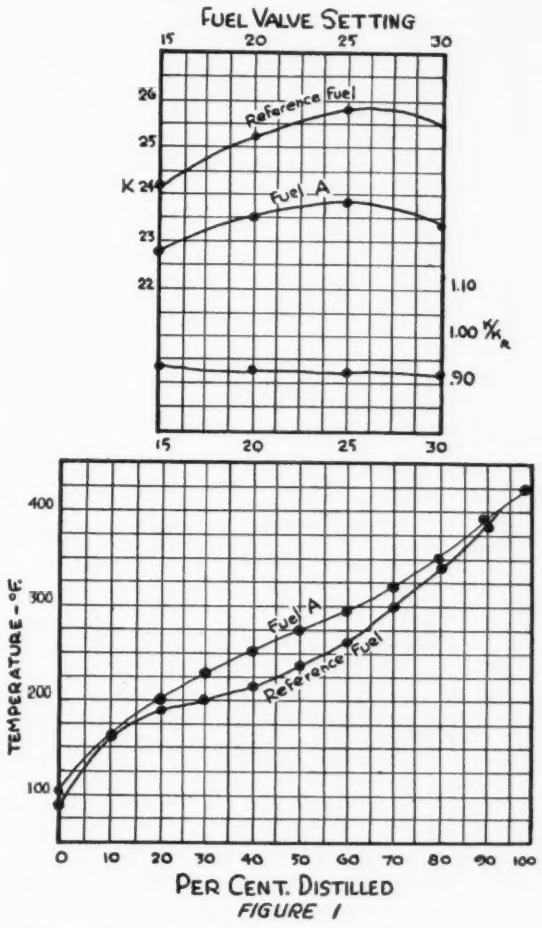

FIGURE 1

IN CONDUCTING a test the following procedure is followed:

(a) The engine is operated for approximately 30 minutes, to stabilize conditions and bring all parts to operating temperatures. The cylinder head temperature, as measured on the exhaust side, close to the spark plug, is adjusted to an arbitrary standard of 475 degrees Fahr., through control of the amount of cooling air circulated.

(b) The spark is set at the most advanced position at which maximum power occurs with the standard test fuel. This adjustment is made with the leanest mixture ratio at which maximum power occurs.

(c) The fuel metering valve is adjusted to a "lean" position and the engine load adjusted so that knocking is about to occur. This will probably cause gas formation, by the Midgley bouncing pin, at the rate of 0.3 cc. per minute. As a check on the adjustment slightly increase the load—a tendency toward "rough running" should result and the gas formation should increase.

(d) Measure the crank speed, volts and amperes. The cylinder head temperature and gas formation should also be measured, as a check and if they vary an appreciable amount from the desired values of 475 degrees Fahr. and 0.3 cc. respectively, the run should be repeated. Record the fuel metering valve and spark setting.

(e) Having completed (c) and (d) with the reference fuel, repeat it with the fuel being studied.

(f) Having completed a set of measurements with the lean mixture ratio, repeat (c), (d) and (e) with three richer mix-

*President, Leamon Process Co.

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NATIONAL PETROLEUM NEWS

1213 W. 3rd St., Cleveland, O.

Table 1

Leamon Process Co.

Single Cylinder Engine Log and Result Sheet

Choke 7 — Spark Advance +25° — Compression Rate 5.5/1 — Date 4/2/27

Run No.	Fuel	Mixture setting	Head Temperature	C. C. gas	*R.P.M.	Volts	Amperes	Watts	K Watts/R.P.M.	K/KR	Remarks
1	Reference	15	475	0.30	65.0	17.5	90.0	.....	24.2	0.942	
2	A	15	480	0.30	69.0	17.5	90.0	.....	22.8	.....	
3	Reference	20	480	0.35	62.5	17.5	90.0	.....	25.2	0.936	
4	A	20	470	0.30	63.5	17.0	88.0	.....	23.6	.....	
5	Reference	25	465	0.30	61.0	17.5	90.0	.....	25.8	0.923	
6	A	25	470	0.35	62.5	17.0	87.5	.....	23.8	.....	
7	Reference	30	480	0.25	60.0	17.0	90.0	.....	25.5	0.918	
8	A	30	480	0.30	60.0	16.5	85.0	.....	23.4	.....	

Remarks

*Broken tachometer replaced by automobile speedometer reading in miles per hour. Above test made by F. W. Eley, laboratory engineer.

ture ratios. A sufficiently accurate adjustment can be made by determining the lean setting of the fuel metering valve as in (c) and the richest setting at which maximum power occurs—then equally divide the movement of the valve into three parts, making four valve settings in all.

(g) From the data taken determine the fuel metering valve setting at which maximum power occurred with the reference fuel and with this setting repeat (c), (d), (e) and (f) with three additional spark settings covering the range from considerable retard to considerable over advance.

THE above method covers a complete set of measurements and requires one hour of testing time to complete. Experience with the test engine and various fuels usually makes it unnecessary to conduct all parts of the test—the effect of spark advance need seldom be determined.

Five fuels can be tested during each run and although more fuels can be handled at one time, five is a convenient number as it affords the opportunity to conveniently plot the results on a single sheet of paper and does not require an attendant to change fuels.

In testing several fuels it is only necessary to make a single set of measurements with the reference fuel, that is, measurements can be made with the reference fuel and followed by measurements with each of the other four fuels, then proceed to the next mixture setting and repeat.

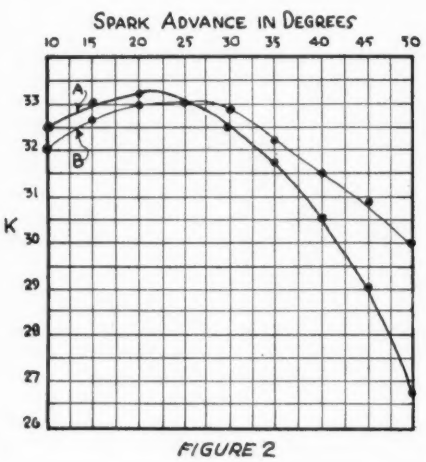

FIGURE 2

Analysis of Results

A SAMPLE log and result sheet appears as Table 1. Results are plotted on Figure 1 with distillation curves of the two fuels tested. The two upper curves show the relative mean effective pressures at which knocking was about to begin. The lower curve of the upper block is the ratio of the MEP developed with fuel A to that developed with the reference fuel.

It shows that at all points the reference fuel was much superior and that its superiority increased as the richness of the mixture increased. Figure 2 shows the effect of variation in spark advance on the relative anti-knock of fuels. It will be noted that with considerable retard, fuel A is superior to the reference fuel, whereas with considerable over advance the reverse is true.

This can be explained by the fact that with retarded spark detonation was probably the controlling factor, whereas with advanced spark, pre-ignition was the controlling factor. This may account for some of the varying reports with regard to the anti-knock qualities of fuel.

In a motor car operating with somewhat retarded spark and cold cylinder jackets, fuel A may have superior anti-knock value, while in another motor car operating with greater spark advance and hotter cylinder jackets, fuel B may be superior. Variation in comparison ratio has somewhat the same effect on the relative anti-knock value of fuels as does variation in spark advance.

However, the single cylinder test engine, with spark advance for maximum power as determined with a reference fuel composed of 40 per cent benzol, 60 per cent California gasoline and a compression ratio of 6¾ to 1, has been found to give results comparable with those attained in the average multi-cylinder automobile engine.

Figure 3 is interesting in that it shows the effect of adding varying quantities of natural gasoline, relatively low in anti-knock, to a heavy

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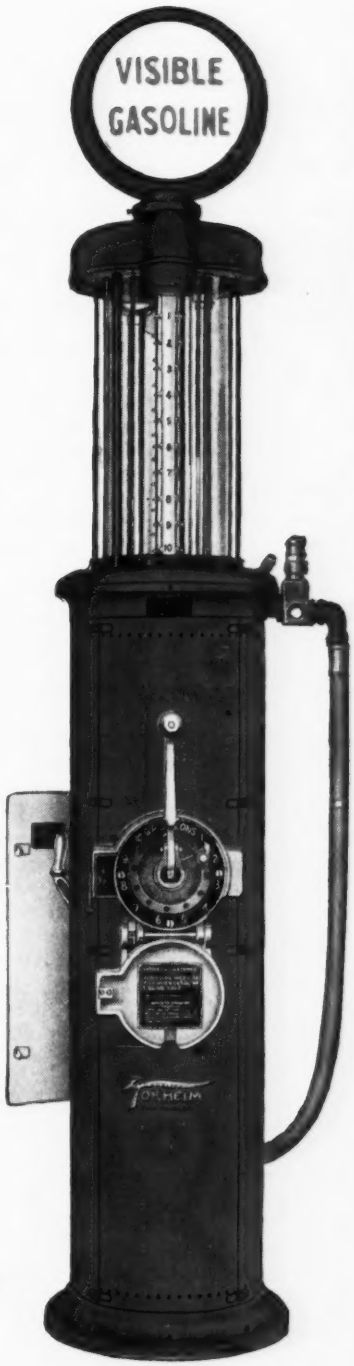

TOKHEIM

Master Control

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fuel which is relatively high in anti-knock. The anti-knock of the heavy fuel B was in excess of that of the reference fuel A with a rich mixture setting (41) but at the mixture setting for maximum power (32) with the reference fuel, the fuel B was decidedly inferior.

Adding the light natural gasoline to the heavy fuel B resulted in increasing the anti-knock value with the lean mixtures so that it became superior to the reference fuel, even with the mixture best suited to the reference fuel. Adding an excess quantity of natural gasoline decreased the anti-knock value of the heavy fuel.

Description of Apparatus

THE following are the most important items entering into the single-cylinder engine testing equipment:

A test room, 6 feet 9 inches x 8 feet, with shelves on one side for holding test samples, the main fuel supply outside and the test engine in one corner, all conveniently arranged for efficient operation.

A standard, air-cooled Delco-Light 850-watt, gasoline driven, 32-volt generating set, modified as later described.

A Midgley bouncing pin apparatus for detecting knocking.

Open scale voltmeter and ammeter for making power measurements.

A special fuel-air metering and mixing valve and accessories.

A special fuel supply and metering system.

A pyrometer for measurement of the cylinder head temperature.

Generator Wiring

THE generating set as delivered is compound wound. To effect the control desired a 3-ampere 80-ohm rheostat is inserted in the shunt field circuit. A lamp bank or resistance wire load is used for dissipating the power generated. With full field strength the load is sufficient to stall the engine but by increasing the shunt field resistance the load can be varied at will and with a high degree of precision.

The engine is started in the usual manner with the shunt field rheostat out of the circuit, the special ignition switch open and the load switch thrown to the battery load position. To throw over to the resistance wire or lamp bank load move the load switch to the proper position and close the ignition switch.

When used as a generator for battery charging, the ignition circuit is closed through the overload-undervoltage relay; if the relay opens the ignition switch is also automatically opened, which prevents "running away" of the engine. To prevent opening of the relay when testing it is shunted out of the circuit, consequently a separate ignition circuit must be provided and is controlled by a small switch.

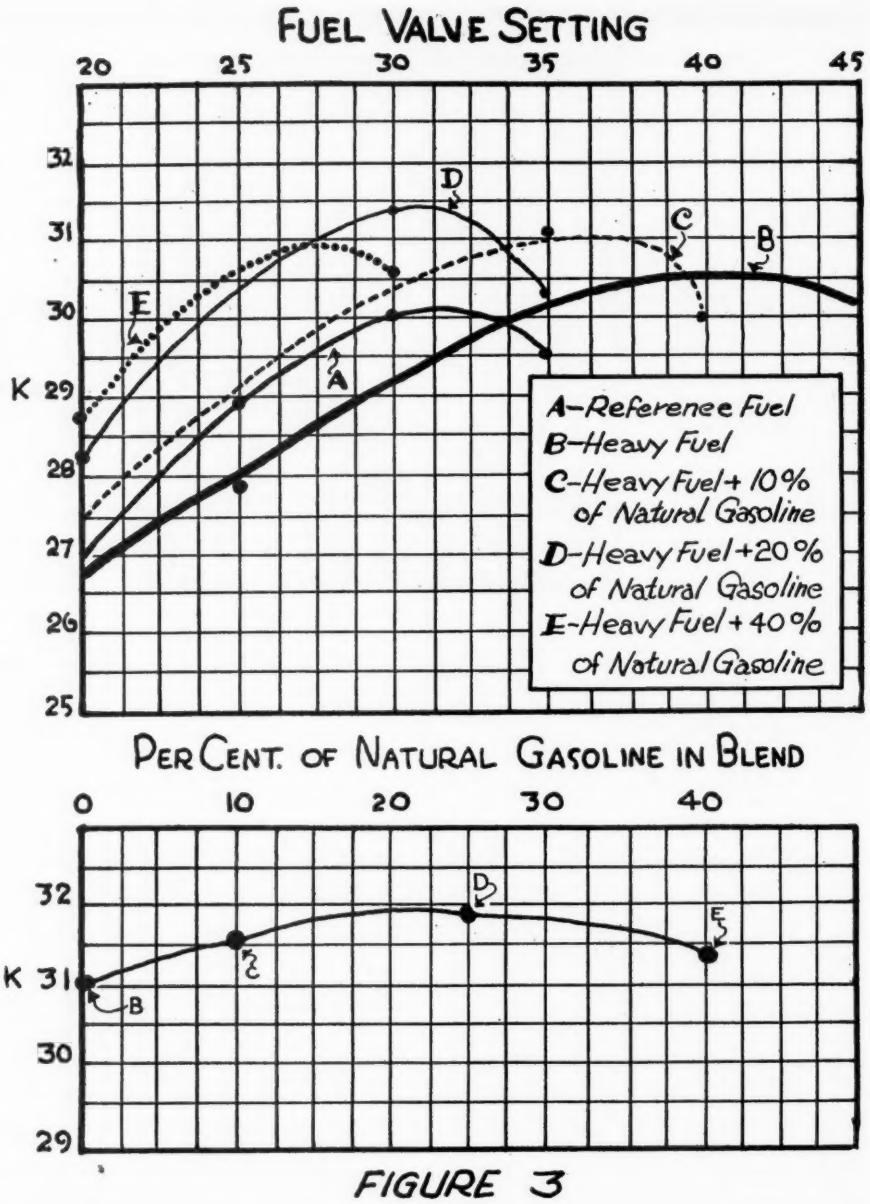


FIGURE 3

Fuel and Air Metering

THE venturi fuel mixing device supplied with the engine is replaced by a special venturi mixing device, provided with five fuel supply pipes and shut-off cocks so that fuel from either of the five tanks can be supplied to the engine. Automobile carburetors are used for maintenance of fuel levels.

THE most used reference fuel is stored in a 5-gallon container which is provided with a vented cap and a drain cock. Fuel flows through a valve to the measuring container consisting of 30 inches of 2-inch pipe which also has a vent pipe and drain cock. From here the fuel flows through the gage glass fitting pipe, valve and another fitting to the carburetor, which serves merely as a level maintaining device. From here the fuel flows through a pipe to the mixing valve.

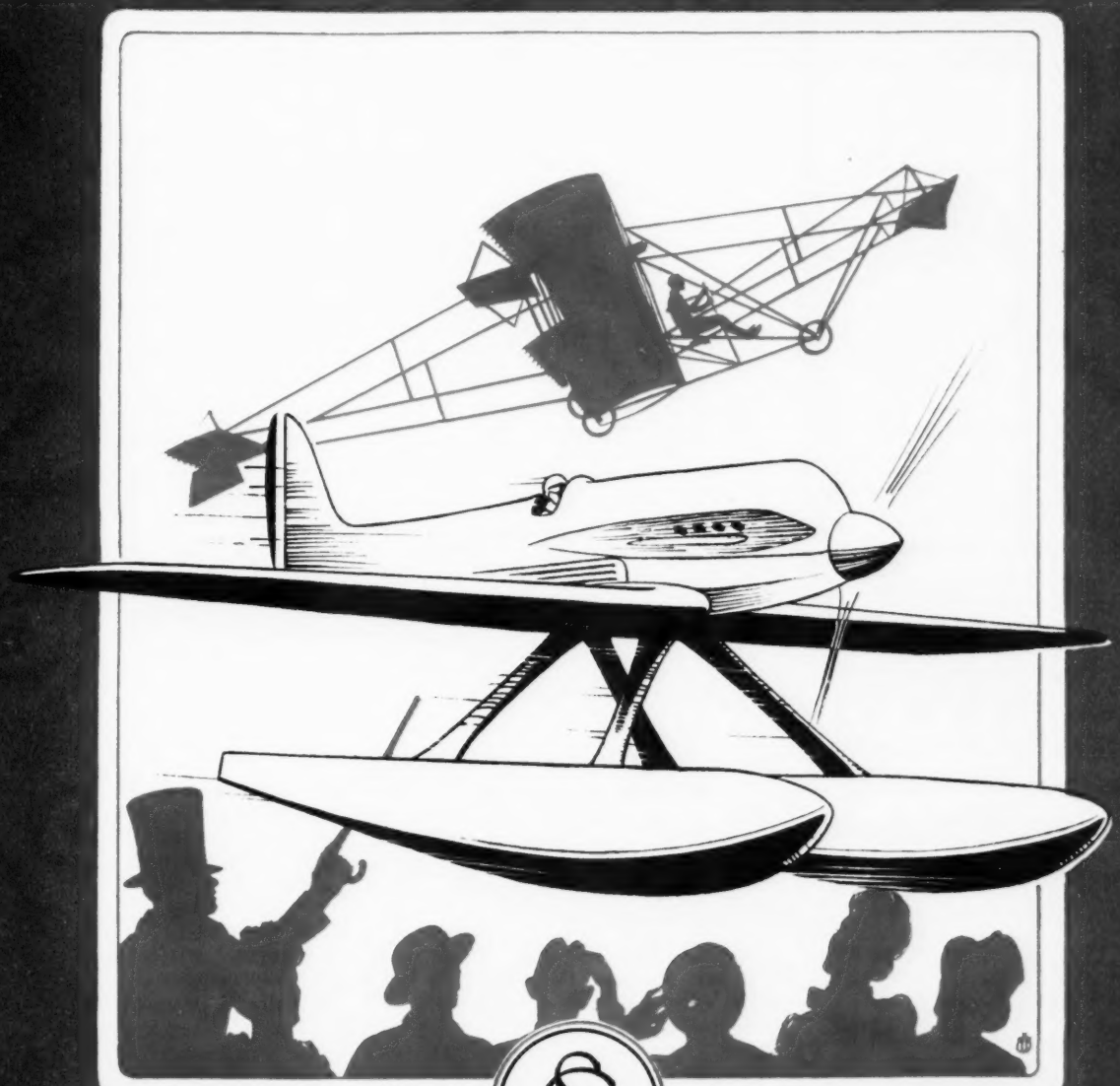
In making fuel consumption measurements the valve in the gage glass fitting is closed and the time recorded for the fuel to flow from a high to a low datum point on the calibrated gage glass.

Two fuel supply systems are provided with two fuel measuring tanks, and three are without. In the latter case the fitting is replaced by a one-point open top container which holds enough fuel for completion of a test.

The line slopes to the carburetor fitting so that opening a cock will result in quick draining of the carburetor and fuel line. In changing fuels the cock at the mixing valve is opened for venting the line.

In the fuel mixing valve the body is machined with the outside diameter to screw into a standard ¾-inch pipe coupling and the manifold brazed or welded to it. The passages must be of small diameter to eliminate fuel contamination when shifting from one fuel to another. The needle valve is screwed into split threaded bushing, which in turn is screwed into the body. After tapping, the bushing is squeezed together to provide the fric-

THE NEW ERA



The struggle to conquer the air was in the beginning a matter of aeronautics. The inital problem of air foil and aerial dynamics first engaged the minds of the intrepid pioneers who were contented with light motors sufficient only to lift the plane from the ground. Speed and motor efficiency later became the factor in advancement and developed steadily to finally achieve the astonishing record of over three hundred miles per hour and a sustained flight of over fifty hours in the air.

The new era has now entered the era of scientific fueling. Chestnut & Smith Corporation, manufacturers of Natural Gasoline, were the first to realize this need and were successful in developing NATURALINE, the super-aviation motor fuel which through exhaustive test and experiment has demonstrated its superiority. It is forty-six pounds per hundred gallons less than U. S. fighting grade gasoline—is exceedingly high in anti-knock qualities and eliminates "gas-lock" and the formation of carbon.

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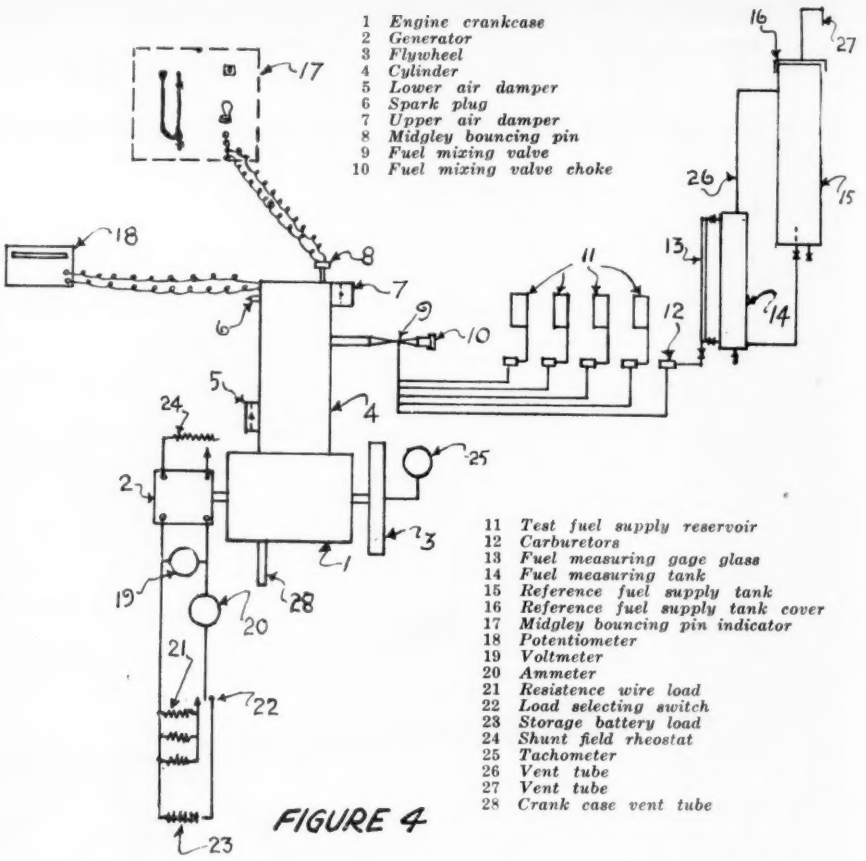

FIGURE 4

tion necessary to prevent the needle valve from turning. An index is provided to coincide with graduations on the needle valve wheel. A cap is provided to control the quantity of air supplied to the cylinder. Caps with different size holes are provided and the proper size is selected for a given set of operating conditions; however, most of the testing is done with one cap. The venturi throat diameter is ½-inch.

Damper Control

The upper cold air inlet damper is inserted in a cylindrical pipe and the lower is inserted in a rectangular duct, brazed or soldered to the side of the air casing surrounding the cylinder. It is to be noted that the Delco-Light engine flywheel is provided with vanes for sucking air down past the engine cylinder head and around the crankcase. Closing the upper damper and opening the lower, results in air being drawn in through the lower, thereby short circuiting the cylinder head and increasing its temperature.

Instrument Board

The instrument board is carefully arranged so that all instruments can be easily and accurately read. A Western Model 269 voltmeter having a scale range of 0-40 volts and similar ammeter having a range of 0-60 amperes is used. A photographic darkroom clock having a minute hand that can be started and stopped at will, has been found very satisfactory. An 80-ohm—3-ampere field rheostat is bolted to a horizontal member on the underside of the desk. This provided an extremely convenient location.

Reference

Diagram of original wiring of Generator—"Supplement Service Manual, Electrical," Delco-Light Co., Dayton, O.

Correction

In analysis of U. S. Bureau of Mines petroleum statistics for September in the Nov. 16 NATIONAL PETROLEUM NEWS the table headed "Gasoline Situation by Districts—Barrels", next to bottom table on page 62, covered the kerosene statistics for September. The table at top of page 75 headed "Kerosene Situation by Districts", covers the gasoline statistics. The headlines for the two tables were transposed. In enumerated points in the September report on page 69 the figure in No. 1 should have been 2,502,700 daily average crude production for September instead of 2.516,100 which was the August average.

On page 37 of the same issue in table on Montana gasoline output, exports and imports, columns should be dated beginning with 1923 on the left and 1926 the last column on the right instead of the reverse.

Safety and Prevention of Fires In Natural Gasoline Plants

By George F. Prussing*

Presented before the California Natural Gasoline Association fall meeting, Los Angeles, Nov. 15.

JERRY SHEA who was to have prepared and presented this paper, followed H. C. Miller as safety engineer of the Bureau of Mines, as signed to the petroleum industry on the coast. For the past several months he has been studying the very problem represented by the title of this paper and since he has been inopportunely called east, we shall have to look forward to his official report to discover what he has learned of the hazards of this fast growing part of the oil business.

As a last minute substitute for Mr. Shea, I can bring you little that is based on a minute study of your own unique hazards, backed by statistics of California accidents. Rather, I will give you, if I may, the story of how the petroleum industry has met this same problem in other departments and let you apply the lesson to your own peculiar hazards.

There is something very suggestive about the title of this paper and perhaps nowhere in the oil industry does it so accurately hit the mark. Especially when viewing the short history of the natural gas-gasoline industry in California, is the fact borne in upon one that in that industry safety IS fire prevention.

Read the keen analyses of fatal accidents in the California petroleum industry made each year by Mr. Miller and you will discover that the refining of crude oil has become so safe that during 1926 there were no fatal accidents that were pertinent to the actual refining of oil.

This marked control over a really hazardous business is made even more striking when the fatalities at natural gas-gasoline plants are reviewed. Not only is the ratio of deaths to men employed exceedingly high but in almost every case the cause of these deaths has been fire.

SAFETY in any branch of the oil business starts with the study of experience, goes next through a phase of engineering revision and ends in the education of personnel in safe practices. Perhaps "ends" is the wrong word, for the education of personnel never ends, if it is to be successful. We cannot, however, undertake either engineering revision or education until we know what is causing our accidents, how serious these are and how much they are costing us and our men.

The first step is, therefore, the very prosaic one of getting prompt, accurate account of every accident that requires first aid or medical care or that causes a man to lose time from his regular duties. The simplest means to that end is to insist that the provisions of the Industrial Accident Commission are strictly complied with, for in California such accidents as I have defined must be reported. Have these reports made somebody's business, so that they are properly made out, promptly sent to headquarters and there analyzed and called to the attenton of the man in charge of operations.

EVERY accident that so disables a man that he must leave his work, either for medical care or because he is incapacitated, should be investigated by someone competent to get at first causes. Of all the silly fiction with which this age is cursed, the worst is by all means the usual accident report. "Burned face while lighting boiler," says the report. "Few days" for estimated disability.

An honest investigation reveals the following facts:

The gas burner had no pilot light. The plant operator had hired a fireman on the latter's statement that he knew all about firing boilers, having rough-necked on a drilling rig. Having pinched the fire down to nearly nothing, a gust of wind had struck the unprotected setting and had blown out the flame. With hand on gas valve, the fireman had peered in to see if the fire had really gone out or was merely hiding out somewhere in the firebox.

The explosion which burned his face also wrecked the boiler setting. Even the "few days" estimate of disability proved to be an optimist's dream, lengthening into 12 weeks, costing the man the use of one eye and his company a medical and compensation bill of nearly $4000. There we have a picture of a plant needing engineering revision along definite lines, an organization in need of overhauling, especially in the hiring and training of men and discipline in the enforcement of the most elementary items of safe operation.

Interest is the moving force of success and to create interest we appeal to each man in the language he best understands. Selfishness is an unkind term and so we call it enlightened self interest, when we tell the management that certain items in the budget are for the purpose of preventing accidents. For accidents are pure waste, costly in man power, in material, in good hard cash paid out for doctors' bills and in unnecessary suffering.

Having therefore set up the machinery for getting to the man in charge of operations each day the real story of how accidents occur, it is no more difficult to get the funds to cure them than it is to overcome any other error in operating technique.

If our management is frequently enough hit in the eye with the cold fact that practically all gas plant accidents are preventable, the word will soon go down the line that accidents must stop.

WHAT can we truthfully say as to the cost of accidents? Just this, that there is no single item of waste in modern industry in which the cost is so high. Whether we pay the toll to an insurance company or absorb it as part of the operating expense, even the direct money cost of caring for the injured is a tremendous burden.

Consider this other fact, no less true though seldom mentioned. For every dollar spent for compensation and medical care of the industrially injured, not less than $4 are spent in incidental costs. The wrecked boiler setting, the training of a new man, the lost time of fellow workmen, the added supervision of foremen, the upset of morale, these are items which can all be translated into dollars drawn from the profit side of our operations and to what end? When pounding sand down the proverbial rat-hole is classed among gainful occupations, then and not till then can management afford to become complacent about the money cost of industrial accidents.

In this connection it may not be amiss to mention that management has already seen this point. Not in every company, it is true, but in the larger more far sighted organizations

*Chairman, Petroleum Section, National Safety Council.

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and also in certain departments such as your own, headed by clear-thinking technical men, accidents have been outlawed as evidence of bad business.

We see that fact constantly in the statistics reported to the National Safety Council and to the United States Bureau of Mines. Miller shows a constant decline in the fatal accidents among the drilling and producing personnel of the California companies. In 1922 there were 24 fatalities for every hundred million barrels produced; in 1926 the figure was but 11. Had the 1922 rate prevailed during 1923-4-5 and 6, 131 men would have lost their lives, who now are living.

TRANSLATE that number of lives into dollars by whatever formula we will, it represents the profit due to safety. I have seen many of the results of fatal accidents in this business of ours but no poor devil laid out in death nor heartbroken widow and fatherless children have ever been so eloquent as is the picture of these 131 men, that safety pays and that management knows and cares.

If I had presumed to suggest that you sell safety to your management by showing them the real cause of accidents, you must pardon it as something of an obsession that has come from hard and painful experience and the observation of others who have been far more successful in their efforts.

Only from management can come the dollars that make possible the use of proper materials, the costly guards about machinery, the even more costly time for planning plant design properly instead of gambling. The head of the most successful contracting firm in this city told us that their profit comes from painstaking planning of every operation on paper.

I know that in the gas industry changes in operating technique must first pass the bright boys with the sharp pencils, and slip sticks and the calculating machines. Just so, the real true cost of chance taking can be tried out and weighed for the benefit of those who hold the purse strings. You can tell your people to a split mill what will be the dollars and cents profit of an added intercooler, an extra stage of compression and the return of gas down a five spot. But have you ever figured the cost of a broken cast iron fitting under a pressure storage tank with your boilers only 100 feet away? Have you assured yourself that nowhere, with the break of a fitting, will that flood of gaseous dynamite find the spark to turn it into a hell of fire?

NOT until you have made as sure as engineering skill permits that your plants are proof against that fortuitous union of fuel and fire, can you justify your positions as the custodians of lives and property.

It may well be said that review of the accident records of our industry shows but a small proportion due to mechanical failure. And true it is that perhaps 20 per cent of the number are mechanical and 80 per cent human in their ultimate cause. It is this very fact, however, that throws the emphasis on guarding the mechanism. When the man fails the unguarded machine takes it toll. My first experience in accident investigation taught me why machinery must be guarded. A temporary pumping plant had been built in a tank farm.

A rotary pump was driven by a large horizontal gas engine set on wooden bolsters, with pits dug for the flywheels. The plant was housed in a rough lumber shack. The plant ran day and night, attended by three tour men whose principal occupations were oiling the engine and trying to sleep in spite of the bark of the exhaust. On the day of the accident, the pumper coming on tour tripped on the threshold and dived head-on into the unguarded flywheel of the gas engine.

Had there been a toe board about the flywheel pit, that man might have saved himself. The marks on the ground showed how hard he had tried to regain his balance, during that instant that death stared him in the face.

HAD there been only a rail, he might have grasped it. But there was nothing—just a temporary plant—not worth spending money on. Yet I am sure that engine had a governor, an oiling system and a fuel supply. The man who installed it—and I mean the superintendent not the mechanic—had judged the importance of these parts correctly enough but he measured human safety in terms of the machine, not the men who ran it.

The safest criterion for judging how well to guard machinery is good horse sense. Remembering that machinery accidents, if few, are always serious, the guard that prevents contact with moving parts is always best. The normal operations that a man must perform can usually be done more efficiently when the chance of being caught has been removed.

Even oiling devices can be rearranged to make them accessible. The average engine designer thinks that the man who oils has wings and flits from oil cup to oil cup over flywheels, cranks and cams. Automobile designers once had a similar notion, though what bird or insect could find the clutch throwout yoke grease cup on a Buick, I know not. The errors and omissions of designers are legion. Try to buy a machine that complies with the law.

I know one manufacturer who writes his own specifications for machinery and includes his own ideas on safe-

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guards, handy-oiling devices and adjusting mechanism. We can not all go so far, but we need not operate a machine until it is right, legally and safely guarded.

We read yesterday of the terrible disaster in Pittsburgh. I can see you all skimming as I did through the graphic news accounts, seeking the few lines of technical explanation that would make the cause of the explosion clear. If you found it, as I did, and if it is correct, that accident will have to be charged against utter disregard of the most elementary safety measures.

THINK of that huge holder with a capacity of five million cubic feet left over night connected to the pipe system, after having been blown free of gas. Think of sending men into such a holder with open torches without testing the atmosphere for gas! Do not think I am condemning anyone, for such is not my purpose, not knowing all the facts.

But here we have a tremendously spectacular example of what in a smaller measure we are daily trying to prevent. You who know gas and oil valves know how little trust can be placed in them after they have been in service for some time. I have read and seen applied some of the rules which you men enforce before you permit a man to enter even the smallest tank or other space where flammable vapors might accumulate. Let me quote from such a set of rules.

"No repair work involving fire or spark producing tools shall be undertaken in any tank or other space subject to gas accumulation until said tank or space shall have been freed of all oil and gas and a certificate to that effect shall have been obtained from a competent chemist.

"No such work shall be undertaken until all lines leading to such tank or space shall have been disconnected or slip blanked. An electrical bond shall be made about each point where a line is to be broken."

IF THAT seems far fetched, remember what happened under the dock at Wilmington a year ago. The ordinary routine steps were taken to free a line of gas before welding was done in a confined space but the one step that might have saved half a dozen men from disaster was omitted. No one apparently made sure that these ordinary precautions had been successful before the torch was applied. They gambled and lost.

In a recent refinery fire some valuable lessons were learned about our fire fighting technique. Briefly, we learned that fighting one mean fire is worth a hundred of the usual perfunctory fire drills. We have as a result for four months been experimenting with a new idea, new at least to us. We have been holding in our

refineries and at our gas plants what we call problem fire drills. Their purpose is three-fold.

We hope to be able to teach our men how to prevent fires by making them fight imaginary fires that might happen anywhere through carelessness or mechanical failure. We hope to make them think out what they would do under such circumstances NOW under the friendly if critical eyes of their superiors, rather than waiting for a time when thought might be impossible. But even more important, we hope to habituate them to go calmly through the technique that may some day save their lives.

Example of Problem Fire Drill Report

Problem: A gasket on top of one of the absorbers blew out and an explosion followed with the entire absorption plant in flames. The absorption plant operator was badly burned.

Execution: The fireman blew the fire whistle and met the compressor plant operator at the fire house. They put the absorption plant operator in the fireman's machine after rendering first aid. The fireman then left with the operator for the emergency hospital. The compressor plant operator then shut the compressor plant down and shut the gas off from the field. He then went to the Rose No. 3 boiler plant and shut it down, closing the main steam header. From here he went to the main boiler plant and shut it down also closing the main header valves. He then went to the office and breaking in telephoned the operator who in turn notified the foreman. As soon as help arrived he attached the fire hose to protect the boiler house and used the 40 gallon Foamite to protect the compressor plant.

Results: Due to the valve arrangement on the gas lines to and from absorption plant in case of a major fire in the absorption plant it could not be bipassed and a complete shut down of the field would be necessary. It also shows that with only three operators on duty at night in case of a fire of this kind all men should be familiar with the operation of the other units.

ALREADY we can say that in a large measure these hopes are being realized. The men are learning the emergency handling of operating equipment as well as fire equipment. They are taking an interest that speaks well for the security of the plants they operate.

I would fail in my duty if I did not mention here the greatest single help that any man in this business who is interested in safety has always at his elbow. The National Safety Council is an organization of men who are interested in saving lives and property and who realize that we cannot any one of us think of everything. We are therefore banded together for the sole purpose

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The manufacture and sale of Ford Non-Chatter Oil is *covered by a patent* (the Sorensen Patent). Do you know whether or not you are infringing this?

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CHICAGO BOSTON CHARLOTTE

WHEN YOU WANT QUALITY AND REASONABLE PRICES

Mixed Carload in Drums—or Tank Cars

"INVINCIBLE" MOTOR OILS

100% Pennsylvania or Western Blends

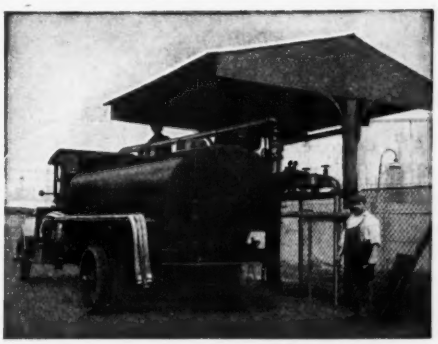
To Match Any Oil Made

WRITE A. D. MILLER SONS' CO.

Millers Oil Refining Works

PITTSBURGH, PENNA.

Oldest Pennsylvania Refiners



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give precise measurements of

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Meter Department

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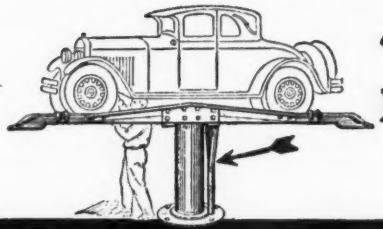

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District Sales Offices
New York, Houston, Atlanta, Boston, New Orleans, Tampa, Philadelphia, Louisville

REFINERS OF OKLAHOMA TEXAS AND LOUISIANA

PETROLEUM

REFINED OIL
GASOLINE
NAPHTHA
GAS OILS
PARAFFINE WAX
PETROLEUM COKE

Fuel Oil--Lubricating Oils

CYLINDER ENGINE
CORDAGE

RED AND PALE PARAFFINE OILS

of exchanging ideas, learning from the other's mistakes and taking freely the ideas which he has found useful. Four thousand employers with payrolls aggregating eight million men and women make up that vast family. In it our petroleum section is one of the most active, numbering more than one hundred of the leading oil companies. Here on the coast the petroleum section is in charge of Mr. Scofield of the Associated Oil Company with Mr. Eggleston of the Pan-American, Mr. Donovan of the Standard, Mr. Lynch of the General Petroleum, Mr. Wolflin of the Calpet and Mr. Anderson of the Richfield making up our local executive group. The Council is termed legally a non-profit organization. Let me say that it is a misnomer, for the profit that comes from working with men like that on safety and fire prevention is very real and very great. One man *cannot* think of everything but a lot of men all working toward the same end can do wonders.

Reavis Visits Gulf Coast Country, Tries Fishing

HOUSTON.—Holland S. Reavis, of New York, former oil publisher and still an active figure in financial phases of the petroleum industry, visited Gulf coastal Texas and Louisiana soon after his recent return from a summer in Europe.

He took occasion on the southwestern trip to visit Hackberry Island, Pa., near Lake Charles, where Harry C. Hanszen and associates had drilled a 1500-barrel well as the field discovery on a previously known salt dome.

Reavis and Hanszen had spent the summer together, playing in Europe, so they couldn't resist the temptation of a day fishing under what "Holly" describes as the finest tree he ever saw. The tree is alongside a bayou within a few hundred feet of the well. Hanszen, who formerly was vice president of the Mexican Gulf Oil Co., now operates as the Calcasieu Oil Co.

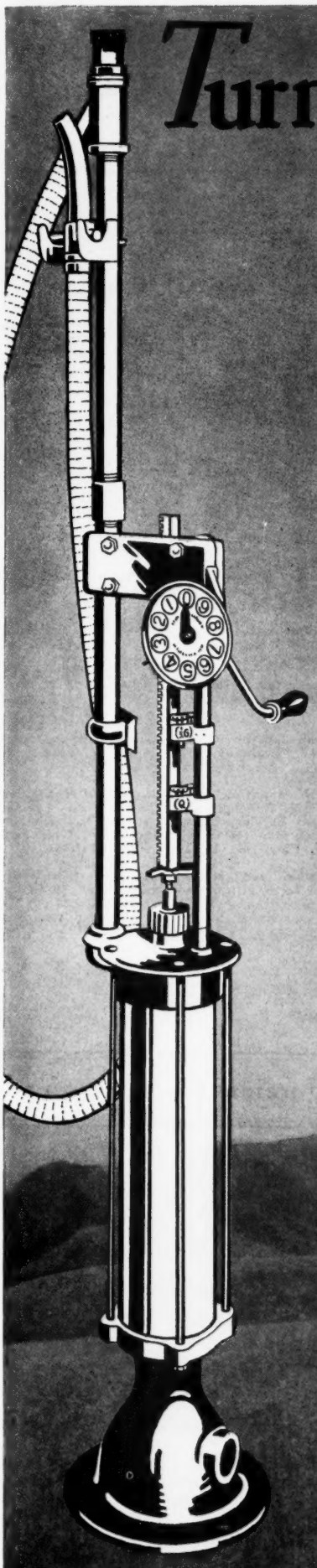
Ohio Producers To Elect Officers

LOGAN, O., Nov. 26.—Some 200 oil and gas producers are expected at the second annual meeting of the Southeastern Ohio Oil & Gas Producers Association, which will be held on the evening of Nov. 29 at the Easterling Club House at Logan.

George White, ex-congressman from Marietta, O., who has been for many years in the oil industry, will be the speaker. The meeting will start out with a dinner at the club house, after which officers for the coming year will be elected and reports from officers and committees will be heard.

Producers from Perry, Hocking, Fairfield, Licking, Muskingum, Athens, Noble and Washington counties are members of the association.

Turning Small Accounts



~into profitable gallonage

MARKETERS who are going after still greater gallonage realize the possibilities in developing small accounts. Farms, small public garages, large private garages, fleet owners—which, taken together, represent an attractively large gallonage.

A profitable gallonage, too, if it is handled at the low cost of the Model T-81 Gallon Pump.

Though low in price, in workmanship this new G. & B. gasoline pump is on a par with the larger G. & B. pumps so widely used by busy filling stations. Every gallon served is recorded on a dial register. Quantity stops for ½ gallon and 1 quart deliveries are also provided. *When desired, the overhead hose discharge will be replaced with a can-filling discharge for handling kerosene.*

Write for prices and specifications. See for yourself that Model T-81 is your best buy in low priced gallon pumps.

GILBERT AND BARKER MANUFACTURING COMPANY
PUMPS AND TANKS FOR THE OIL TRADE
SPRINGFIELD MASS. U.S.A.

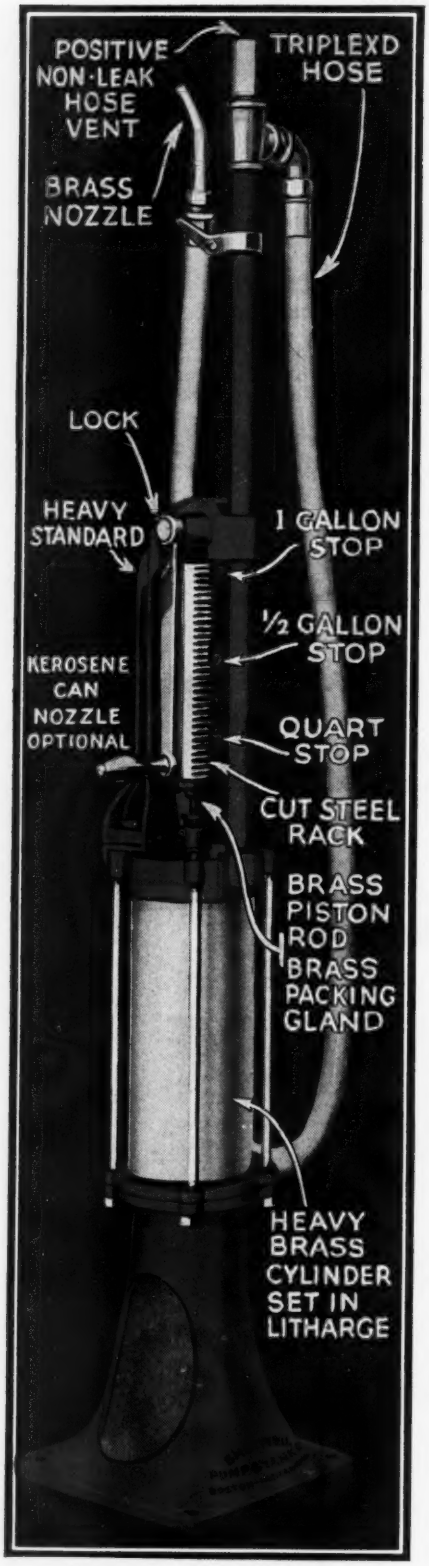
Get Big Gallonage with the Original Famous Shotwell

"LITTLE GIANT"

One-gallon Pumps for Gasoline, Oil or Kerosene

$24.75 In Lots of 4

Special Price Offer
Single Pump - $26
With 200-gal. Tank and Fittings - - - $45.00



Underwriters' Label If Desired
Send for complete catalog our Ball-Bearing Pumps

Shotwell Pump & Tank Co.
Boston **Indianapolis**

NEW PATENTS

National Petroleum News

Nov. 15

REFINING

Process for Continuously Cracking and Fractionating Hydrocarbons—Alexander C. Spencer, Sarnia, Ontario, Canada, assignor to Standard Development Co. Filed July 3, 1923. No. 1,648,967.

Process of Refining Lubricating Oils—Oswald C. Brewster, Casper, Wyo., assignor to The Sharples Specialty Co. Filed Oct. 18, 1921. No. 1,649,095.

Centrifugal Bowl Separator—Oswald C. Brewster, Casper, Wyo., assignor to The Sharples Specialty Co. Filed Nov. 19, 1921. No. 1,649,096.

Process of Treating Emulsified Oils—Gustav Egloff and Harry P. Benner, Chicago, Ill., assignors to Universal Oil Products Co., Chicago, Ill. Filed Sept. 18, 1920. No. 1,649,102.

Apparatus for Treating Emulsified Oil—Gustav Egloff and Harry P. Benner, Chicago, Ill., assignors to Universal Oil Products Co., Chicago. Filed Oct. 23, 1920. No. 1,649,103.

Process of Treating Hydrocarbon Oils—Gustav Egloff, Chicago, Ill., and Robert T. Pollock, New York City, assignors to Universal Oil Products Co., Chicago. Filed Dec. 9, 1920. No. 1,649,104.

Apparatus for Cracking Oil—Gustav Egloff and Harry P. Benner, Independence, Kans., assignors to Universal Oil Products Co., Chicago, Ill. Filed Feb. 11, 1921. No. 1,649,105.

Process of Treating Clays to Adapt Them for Decolorizing and Deodorizing Oils—John Seward Potter, Denver, Colo., assignor to The S. W. Shattuck Chemical Co., Denver, Colo. Filed Aug. 15, 1925. No. 1,649,366.

Process of Producing Aluminum Chloride—Henry Blumenberg, Jr., Moapa, Nev. Filed August 31, 1926. No. 1,649,383.

Process for Treating Cracked Hydrocarbon Distillation Products—Henry Blumenberg, Jr., Moapa, Nev. Filed Feb. 14, 1927. No. 1,649,384.

Filtering Material and Method of Making the same—Henry Blumenberg, Jr., Moapa, Nev. Filed April 14, 1927. No. 1,649,386.

Well-Pumping Apparatus—John Fitzpatrick, Parkerton, Wyo., assignor to The Texas Co., New York City. Filed Feb. 7, 1927. No. 1,649,454.

Distillation of Hydrocarbon Oils—Frank A. Howard, New York City, assignor to Standard Development Co. Filed August 12, 1920. No. 1,649,532.

PRODUCING

Apparatus for Mixing and Proportioning Material—Erle Palmer Halliburton, Los Angeles, Calif. Filed Sept. 16, 1926. No. 1,649,062.

Pumping Jack—Hubert J. Smith, Long Beach, Calif. Filed Sept. 2, 1926. No. 1,649,137.

Drilling Machine or Drilling Rig—Leo. A. Krupp, Akron, Ohio, assignor to The Star Drilling Machine Co., Akron, Ohio. Filed Jan. 20, 1927.

Oil and Water Separator for Oil Wells—Mark C. Hammond, Richburg, New York, assignor to Forest Oil Corp., Bradford, New York. Filed Nov. 13, 1924. No. 1,649,524.

Gas, Oil, and Sand Separator.—Thomas H. Chandler, Long Beach, and William H. Stigall, Taft, Calif. Filed Sept. 29, 1924. No. 1,649,570.

Pump Grip—Nolon I. Clark, Beggs, Okla. Filed June 25, 1926. No. 1,649,573.

Deep-Well Pump.—Oscar W. Johnson, Rockford, Ill., assignor to Ward-Love Pump Corp., Rockford, Ill. Filed Oct. 25, 1924. No. 1,649,593.

Well Fishing Tool—Thomas F. Hess, Westville, Okla. Filed Nov. 27, 1927. No. 1,649,693.

NATURAL GASOLINE

Method of and Apparatus for Making Gasoline—Forest E. Gilmore, Los Angeles, Calif., assignor to Frank Ahlburg, Los Angeles, Calif., and to William K. White, San Francisco, Calif. Filed Aug. 5, 1924. No. 1,649,345.

Spiral Baffle—Millard F. Waters, Tulsa, Okla., assignor to Smith Separator Co., Tulsa, Okla Filed Sept. 30, 1925. No. 1,649,556.

Gravity Balance—William A. C. Schlueter, Tulsa, Okla., assignor to The Refinery Supply Co., Tulsa, Okla. Filed Oct. 20, 1926. No. 1,649,746.

MISCELLANEOUS

Fuller's Earth-Treating Process—Rudolph R. Rosenbau, Chicago, Ill. Filed Jan. 29, 1927. No. 1,649,193.

Retort for Treating Oil Shale—Edward B. Roth, St. Louis, Mo. Filed June 30, 1926. No. 1,649,195.

Apparatus for Sampling Oils—Earle W. Gard, Wilmington, Calif. Filed Sept. 19, 1925. No. 1,649,399.

Filter—Joseph Herrmann and Max Stauber Cologne, Germany. Filed April 24, 1924. (In Germany May 22, 1923.) No. 1,649,405.

Tank Mounting and Multiple-Unit Tank Car.—Victor Willoughby, Ridgewood, N. J., and Adolph Kassler, New York, N. Y., assignors to American Car and Foundry Co., New York City. Filed Dec. 15, 1926. No. 1,649,432.

Method and Means for Removing Filter Cakes from Filter Mediums.—Albert L. Genter and Jasper A. McCaskell, Salt Lake City, Utah, assignors to United Filters Corp., New York City. Filed April 29, 1921. No. 1,649,581.

Tank Lock—Camile Edwin Halaby, New York, N. Y., assignor to Yankee Lock Corp., New York City. Filed April 17, 1925. No. 1,649,587.

Foreign Opportunities

Reserved information may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, and its district and cooperative offices by duly registered firms and individuals upon written request by opportunity number. The Bureau does not furnish credit ratings or assume responsibility as to the standing of foreign inquirers; the usual precautions should be taken in all cases, and where no references are offered it does not necessarily imply that satisfactory references could not be given. Correspondence may be in English unless otherwise stated.

28187.—**Lubricating oils,** Sydney, Australia, purchase or agency.

28192.—**Mineral oils** (unspecified) Bangkok, Siam, purchase and agency.

A. G. Maguire Goes West

MILWAUKEE, Nov. 26.—A. G. Maguire, president of Bartles-Maguire Oil Co. is leaving for California soon to escape Wisconsin's wintry blasts. His headquarters will be at Los Angeles.

Double-Barrelled
Economy

1. A better 600 fire test oil for less money.
2. A less amount is required to make oils of given viscosities.

Specifications of No. 87

VISCOSITY 150 TO 175 AT 210° F. · COLOR 7
CONRADSON CARBON BELOW 1%
LOW COLD TEST · GOOD DEMULSIBILITY

and FIRE 600

Resultant oils can be sold as 100% lubricants . . . no cylinder stock . . . no wax . . . no hard carbon

WRITE *for full information and mixing formulas*

SUN OIL COMPANY, PHILADELPHIA
BRANCHES IN PRINCIPAL CITIES

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No. 87

QUALITY
GUSTAFSON
SERVICE

PENNSYLVANIA LUBRICATING OILS

By handling Pennsylvania Lubricating Oils exclusively we are able to render prompt service to jobbers direct from the refinery in carloads and drum lots.

In addition to this special lubricating oil service, our special refinery connections enable us to make attractive contracts with jobbers for their requirements of

Fuel Oil—Gas Oil and Distillate

It will pay you to accept the numerous advantages offered by our source of supply and complete service organization.

Let us discuss your requirements with you. An inquiry places you under no obligation of any kind.

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Sales Forces and Truck Fleets

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Accurate—Compact—Convenient

They realize the great convenience of coupon payments and they choose filling stations that can give them that service. Allison Coupon Books are always accurate—furnished in stock or special designs. *Send for samples and prices.*

Allison Coupon Company
Indianapolis, Indiana
Coupon Book Specialists Since 1888

New Stations Building

Red Wing, Minn.—Consumers Gas & Oil Co. will build bulk and filling station.

Elk River, Minn.—Odegard-Hoglund Co. purchased site for filling station.

Morrison, Ill.—Roxana Petroleum Corp. and The Texas Co. will each build filling station.

Mt. Vernon, Ill.—H. C. Maymon will erect filling station.

Medford, Ore.—Richfield Oil Co., is completing filling station.

Hinckley, Minn.—Northwestern Oil Co. will build filling station.

Waterloo, Ia.—R. A. Kentzelman seeks permit for filling station.

Edgewood, Ia.—Edgewood Oil Co. is completing filling station.

Muskogee, Okla.—Marland Refining Co. will build filling station at 24th St. and West Okmulgee Ave.

Cushing, Okla.—J. A. Taylor will build garage and filling station.

Tulsa, Okla.—Mid-Continent Petroleum Corp. is contemplating its first filling station here.

Fredericksburg, Tex.—Adolf Stahl is building filling station.

Fayettville, Ark.—W. L. Moore seeks permit for filling station.

Clearwater, Kan.—Co-Operative Oil Co. will build filling station.

Macon, Ga.—Three filling stations will be built here, one each by: Pan American Southern Petroleum Co., Wofford Oil Co., and Steve M. Solomon.

Medicine Lodge, Kan.—Peoples Oil & Gas Co. will erect filling station.

Williamsport, O.—Frank Clark is completing filling station and garage.

East Palestine, O.—John Roberts will build filling station.

Youngstown, O.—National Refining Co. will build $100,000 bulk station, office building, garage and service station in Mahoning in the Wickliffe addition, it is reported. Service stations will also be erected in Youngstown and vicinity.

Washington, D. C.—Standard Oil Co. (New Jersey) has purchased site near Brandywine here for filling station.

Hamilton, O.—Albert J. Crone and Albert H. Stuhlmueller each are building filling station here.

Baraboo, Wis.—Philbrick Garage purchased site for filling station.

Richmond, Va.—The Texas Co. leased property for filling station.

HOUSTON.—Al Guiberson of Los Angeles, oil producer and member of the widely known family of equipment manufacturers, has been spending a few weeks in Texas, visiting his brother-in-law, R. S. Haseltine, general manager of the Guiberson Corp., Dallas, and others. Mr. Haseltine recently returned from a summer of business and pleasure in Europe and Asia.

HOUSTON.—D. L. Reid, general manager of the East Coast Oil Co. of Mexico, S. A., Southern Pacific subsidiary, has returned to headquarters at Tucson, Ariz., after a business trip to the Tampico district.

New Equipment

The Lincoln Electric Co., Cleveland, O., has appointed R. M. Plympton as salesman in charge of consumer motor business in Chicago. He will work under the direction of R. D. Malm, Chicago district manager. Mr. Plympton was formerly assistant sales manager for the Babson Statistical Association at Wellsley Hills, Mass.

* * *

Erie Meter Systems, Inc., Erie, Pa., has announced that it will make Erie motor oil units for dispensing motor oil, kerosene and alcohol, to harmonize with its gasoline dispensing units. Tanks holding the motor oil may be buried or placed in the basement of the building.

With the motor oil unit installed on the driveway alongside the gasoline dispensing unit, motor oil is suggested to the motorist, is the company's idea in placing it there. Other advantages claimed for the Erie motor oil system are more speedy service, cleanliness about the station, accuracy in checking oil sales and a trade-inviting appearance.

The company has also recently published a bulletin describing and illustrating its line of metal cabinet units, including the Trade Commander, the Trade Solicitor, and the Trade Attractor, all of which are being offered the oil marketing trade for modern gasoline dispensing equipment. Refinements in design, improvements in construction and better finish are some of the features claimed for these devices.

* * *

Fry Equipment Corp., Rochester, Pa., has developed the Speedboy, an improved gasoline pump which is claimed to be more speedy and accurate in delivering gasoline into an automobile tank. The five moving units in the pump are: adjustable measuring tube; measuring tube control rod; centralized control handle; crank for raising and lowering measuring tube; and pump unit.

An outstanding feature of the new device is that the discharge valve is on the top of the measuring tube which means that it is trap-proof, that gasoline cannot be trapped or diverted.

Another feature is the glass cylinder called Fry-X-Oray, which helps gasoline that may have gone off color in transit, to look crystal clear, the company claims.

* * *

Selden Truck Corp., Rochester, N. Y., is doubling its production to handle increased demand for its new Roadmaster 6-cylinder 3-ton speed truck and the improved Pacemaker recently announced. C. G. McDonough, sales director, states that 1927 has been the most profitable year since 1919.

NATURAL GASOLINE

Grades A · AA · B · BB · C
CONTRACT OR SPOT

WILLOCK OIL CORPORATION
First National Bank Building · Phone Atlantic 3110
PITTSBURGH, PA.
52 Years Experience · It Counts

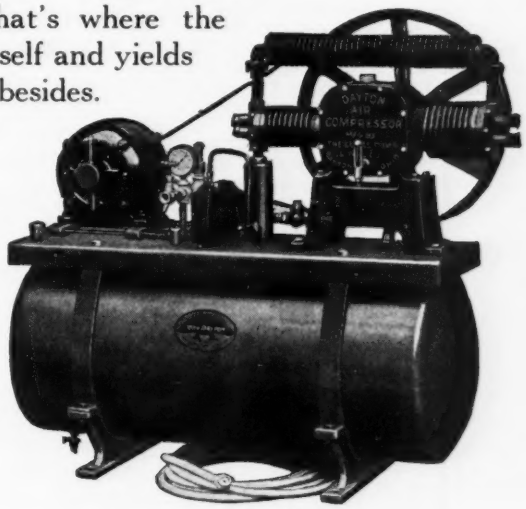
Air Finance

YOU give air service free. Not much margin there, when your selling price is zero. The thing to do is to keep your cost price near zero, too.

That's what the Dayton Air Compressor does for you—it keeps down the cost of air service, both in operation and investment.

Its year in, year out, dependable service brings many gas and oil dollars you would never otherwise see. That's where the Dayton pays for itself and yields a handsome profit besides.

Dayton Style "G" Compressors are made in seven sizes, from 2¼ cubic feet per minute capacity to 8 cubic feet per minute. There is a size which will exactly meet your air requirements.



The G-8
2 H.P. Motor *60 Gallon Tank* *Capacity 8 cubic feet per minute*

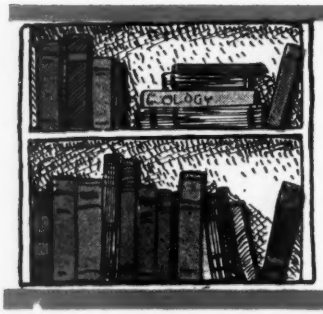
What do you want a Compressor to do? Just write us your problems and our engineers will gladly advise you the style and size compressor that will furnish all the air you need at less cost.

Why the Dayton Is Different
The Dayton Air Compressor has no connecting rod, cross head pin, cotter pins or bolt. Fewer parts means greater efficiency and no trouble.

Send for Bulletin

The LUCAS PUMP & TOOL COMPANY DAYTON, OHIO.
DAYTON AIR COMPRESSORS

425 Valley Street **Dayton, Ohio, U.S.A.**



Oil Man's Bookshelf

Where you and industry are identical—

Every successful business is constantly on the lookout to improve its machinery and methods.

You, as an individual, in order to progress must devote a reasonable part of your time to *improving your mind.*

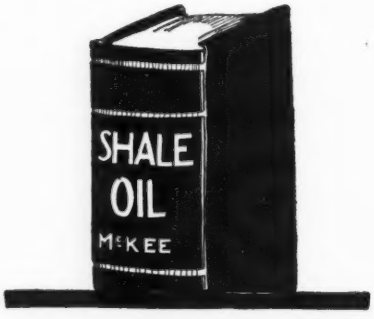
Good books on various phases of the oil industry will improve your mind, and pay you big dividends.

LUBRICATING OIL SALESMAN'S PRIMER

The "Lubricating Oil Salesman's Primer" is a new book by Claude Ettele, associated with one of the big oil companies in this country. The author's purpose is "to properly present a first view of the subject of lubrication and encourage the young salesman to study advanced works without which he will be unable to develop maximum efficiency in the services of his employers and of his customers."

The book takes up the manufacture of various lubricating oils and greases; tests by which oil and grease specifications are written; general discussion of lubrication problems in cylinders, turbines, internal combustion engines; power transmission machinery such as shafting; wire ropes; belts, gears, bearings, etc., driven machines such as air compressors, pneumatic tools, ice machinery, machine tools, textile machinery, paper mills, mine and quarry machinery.

"Lubricating Oil Salesman's Primer" also gives a standard line of lubricants, and specifies which oils or greases are applicable to the various kinds of machinery. This book is well worth its price of $3. Send for your copy today!



If you are interested in the great problem of supplying the world with fuel—get a copy of SHALE OIL.

It is written by men who have devoted years to the investigation of oil shale resources and their uses. R. H. McKee, professor of chemical engineering, Columbia Univ., is chief editor, and other oil shale specialists have contributed chapters as follows:

Origin of Oil Shales—Geology and distribution—Kerogen, the oil yielding material—Fundamental factors in analyzing and evaluating—Refining of shale oils—Nitrogen constituents—Basic factors of industry—Distillation plants—Patents. 325 pages—profusely illustrated, $6.

AMERICAN PETROLEUM REFINING

Employees or heads of refineries in charge of, or planning to extend their plants, will find in this book valuable technical data on the latest design and operation of refineries.

"American Petroleum Refining" is an excellent guide for efficient plant operation. Along heat conservation lines, H. S. Bell, the author, includes much data gained from actual experience.

Among the subjects discussed are: Manufacturing process; Refinery site; Stills; Condensers; Heat exchangers; Cracking; Chemical treatment; Wax plants; Filtering; Cold settling; Compounding; Storage; Volume measurements; Bulk transportation; Packages; Power plant and boiler house; Acid recovery; Fire protection.

475 pages—263 illustrations—$5.

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National Petroleum News,
1213 W. 3rd St., Cleveland, Ohio.

I want the books checked below. Enclosed is check or money order for $_____

- ☐ *Lubricating Oil Salesman's Primer* $3
- ☐ *Shale Oil* $6
- ☐ *American Petroleum Refining* $5

NAME_____

Address_____

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ON THE LAZY BENCH

National Petroleum News

"Harmony" For Oil Men

One who understood human psychology once remarked: "Let me write the songs of a Nation and I care not who makes its laws."

Whenever and wherever oil men assemble there is music. It is not always harmonious. Often it is merely the noise of the anvil chorus. Sometimes there is group singing. But always there is song.

Rumor has it that in preparation for the A.P.I. Annual Meeting, the notorious A.B.C.D. quartette, composed entirely of successful singing oil men, has gone voluntarily into seclusion to rehearse some new scores written by a celebrated composer of popular songs.

Recently and quite unexpectedly, to be sure, a NATIONAL PETROLEUM NEWS correspondent succeeded in getting a great scoop. He was stealthily secreted where he could listen in on one of these rehearsals. The darkness was complete and notes had to be made on the staff writer's shirt bosom. The transcription may be a trifle faulty, but what was heard sounded something like the following:—

ACT I.

There's a Long, Long Trail!

(*Dedicated to the Oil Producer)

"There are strings of tools out finding,—
New Pools—the oil man's land of dreams,—
Oh, listen to the drills a-grinding!
Watch those walking beams:
There are long, long nights of waiting,—
Until the oil man's dream comes true;
Then watch the price of crude go down
That long, long trail with you!"

(*Explanatory Note: Best results will be obtained with the foregoing song if all producers will sing off-key. The more discord the longer the trail).

ACT II

My Old Refinery Home!

(*The Refiner's Lament)

"The sun shines bright in my Old Refinery Home,
'Tis summer, refiners should make hay;
The weather's very fine and the cars burn lots of gas,—
There's no reason why refining shouldn't pay!
I make stills of gasoline 'til it spills all o'er the floor,
My storage I fill 'til it is tight,—
Bye and by 'Hard Times' comes a-knocking at my door,
Then my Old Refinery Home, good night.

Chorus

Sleep no more, my baby, oh, sleep no more to-day.
I will sing swan song for my Old Refinery Home,
For my Old Refinery Home, G O O D —N I G H T!

(*Explanatory Note: Only refiners will know how to sing the foregoing song with adequate pathos and emotion).

ACT III

Good Morning Mister Oil, Oil Man!

(*Harmony for Oil Marketers)

"Good morning Mister Oil, Oil Man,
With your profit just as short as mine.
Good morning Mister Oil, Oil Man,
We'll meet on the firing line.
Tell all the customers you've busted the trust,—
Reduce gasoline so we can all go bust;
Good morning Mister Oil, Oil Man,
With your profit just as short as—
Your profit just as short as—
Your profit just as short as mine."

(*Explanatory note:—Lines 5 and 6 are important. There must be complete team work along these lines).

(Contributed)

The Scots, Again

"I tell ye, Maggie, our laddy's ga'en tae the dogs."

"And how come, Sandy?"

"Weel, ever since the lad's coom hame from America he wants tae open a gift shop in Glasca."

* * *

A couple of Americans were motoring in the north of England and wished to sleep that night in Scotland. It was dark when they drove in to a small town and they called to a small boy to inquire where they were.

"Give me sixpence and I'll tell ye," said the youth.

"Stop at the next hotel," said one of the Americans. "We're in Scotland now."

—*Skelly News.*

* * *

Wife: "Anne certainly was lucky today at bridge."

Husband: "Did she win?"

Wife: "She won fifty dollars."

Husband: "My goodness! I'll say she was lucky."

Wife: "And, honey—"

Husband: "Yes?"

Wife: "I was the one that lost."

—*Skelly News.*

Light Weight Folio

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Also Makers of Sinclair Gasoline and H-C Gasoline

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Atlanta Boston Chicago Houston Kansas City

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Refinery - Tank Wagon Markets

National Petroleum News

Exporters Buy Mid-Continent Gasoline; Domestic Trade is Quiet

Staff Special
TULSA, Nov. 26

EXPORT buyers continued to hold down stage in the Mid-Continent refinery markets this week.

Inquiries and purchases of gasolines were reported just before the Thanksgiving holiday and immediately afterward, with the interest in export goods considerably better as the week ended.

Reports from Texas indicated at least four major exporters inquired for high gravity gasolines Friday and today. Refiners in Oklahoma reported inquiries also had been received from marketers and brokers who were supposed to be buying for the account of export companies.

Approximately 1,000,000 gallons of 61-63, 390 end point gasoline was bought by the Atlantic Refining Co. from Oklahoma refiners at a price reported around 6.375 cents a gallon, and approximately 500,000 gallons of 64-66, 375 e.p. gasoline at around 6.625 cents a gallon. One large Oklahoma refiner reported an additional 500,000 gallons of 64-66, 375 e.p. gasoline sold at 6.625 cents.

The same company was reported to have bought approximately 2,000,000 gallons of 64-66, 375 e.p. gasoline from north Texas refiners at 6.625 cents a gallon. Other exporters were diligently combing the north Texas field for goods, it was reported today, without being able to get any quantity.

One north Texas refiner said he had checked the field carefully and that he believed virtually every other refiner as well as himself was completely sold up on high gravity gasolines for the remainder of the year. His statement is corroborated by another north Texas refiner who informed the writer early in the week that he was completely sold up on gasoline, kerosene and distillate for the remainder of this year. That the Atlantic Refining Co. came into Oklahoma to buy gasolines also is indicative of the condition in north Texas, especially in view of the fact that the Atlantic buyers entered the market just before Thanksgiving and got all apparently available goods before other buyers issued inquiries.

With north Texas out of the picture as far as high gravity goods are concerned Oklahoma refiners were more optimistic today. They pointed out that even though no more export buying was done in Oklahoma, they would be in better shape to receive their share of the domestic high gravity gasoline business without meeting competition from north Texas.

Domestic orders for 58-60 U. S. Motor gasoline this week have been, on the whole, fewer than last week. The short business week probably is partly to blame.

Monday several large refiners reduced their quotations on 58-60 U. S. Motor from 6.25 cents to 6.125 cents. They continued to get a fair volume of business at this price, while other refiners continued to move their goods at 6 cents. The latter price apparently has been the bottom this week for Oklahoma goods, although numerous reports have been received here of sales made at a lower figure based on Group 3 freight rate. One large refining company, in fact, has reported sales at 5.75 cents, Group 3 basis, from eastern plants, but has not shipped any goods from its Oklahoma plants under 6 cents.

THE reduction in price in Oklahoma was followed late in the week by a fall of 0.125 cent in the price of 58-60 U. S. Motor at Kansas refineries for shipment in Kansas. Texas refiners also posted a flat price of 6 cents on their goods, with some sales to resale agents at 5.75 and 5.875 cents a gallon.

The Louisiana and Arkansas refiners continued to enjoy a good volume of business in their own territories and consequently made no changes in their prices during the week. One large refiner in that district reported he was considerably behind on shipments at present and had been unable to get any goods from others in that area.

Refiners in all areas of the Mid-Continent report that domestic demand for the higher gravity gasolines has been comparatively steady all week, with jobbers being content to buy hand-to-mouth.

"You can't sell the customer any quantity of gasolines ahead nowadays," the salesmanager of a large Oklahoma refinery said recently. "They have heard too many of these 'crude oil rumors' that are always flying around in the industry. Seminole production falls 5,000 barrels and everyone begins to talk of a crude oil shortage and advance in price. The next day production is up 5,000 barrels and everyone is talking overproduction and a cut in crude. The jobber has found it safest to buy only for immediate requirements. They wire in their orders in the morning and in the afternoon wire asking us to trace the car."

NATURAL gasoline prices fell slightly, with the lower grades setting the pace. The colder weather has caused a decided increase in production of grade C and manufacturers have been pushing this commodity on the market as rapidly as possible. Grade A on the other hand has become extremely scarce and is bringing a slightly higher price than grade AA.

No heavy buying for spot shipment developed this week, but manufacturers reported inquiries were coming into the market for goods for next month.

One large manufacturer said Friday that his production for this month was oversold and that he would have to draw from storage, and that virtually all his production for December also was committed.

No demand was reported for kerosenes for export, while domestic business showed a letup. Prices were generally unchanged, however, from those in effect at this time last week. Several refiners who had been holding their 41-43 water white treated goods at 4.75 cents had reduced quotations to 4.625 cents. Little kerosene was available in Arkansas and Louisiana, but the situation was not so tight in north Texas as had been the case the few weeks previously.

Distillate business was somewhat

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GASOLINE

REFINED BY THE MAKERS OF TAGOLENE MOTOR OIL

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

PENNSYLVANIA	Prices Nov. 28	Prices Nov. 21	Prices Nov. 14
52-54 Naphtha	8.00 – 8.50	8.25 – 8.50	8.25 – 8.50
54-56 Naphtha	8.25 – 8.50	8.25 – 8.50	8.25 – 8.50
58-60 Gasoline	8.25 – 8.50	8.00 – 8.25	7.875– 8.25
60-62 Str.-run gasoline	8.50 – 9.00	8.50 – 9.00	8.50 – 9.00
64-66 Str.-run gasoline	9.25 – 9.75	9.25 – 9.75	9.25 – 9.50
68-70 Str.-run gas. 350-360 e.p.	10.00 –10.25	10.00 –10.25	10.00 –10.25
OKLAHOMA			
48-50 450 e.p. naphtha	5.625– 5.875	5.625– 5.875	5.75 – 6.00
50-52 450 e.p. naphtha	5.625– 5.875	5.625– 5.875	5.75 – 6.00
56-58 450 e.p. gasoline	6.00	6.00	6.00
58-60 450 e.p. gasoline	6.00	6.00	6.00
56-58 U. S. Motor, 437 e.p.	††6.125	**6.00 – 6.125	**6.00 – 6.125
58-60 U. S. Motor, 437 e.p.	6.00 – 6.125	6.00 – 6.25	6.00 – 6.25
60-62 437 e.p. gasoline	**6.125– 6.375	**6.125– 6.375	**6.125– 6.375
60-62 400 e.p. gasoline	**6.375– 6.625	**6.375– 6.625	**6.50 – 6.75
64-66 390 e.p. gasoline	**6.75	**6.75	**6.75
64-66 375 e.p. gasoline	**7.00 – 7.125	**7.00 – 7.125	**7.00 – 7.125
68-70 350-360 e.p. gasoline	7.00 – 7.25	7.00 – 7.25	7.125– 7.375
KANSAS (F. O. B. refinery Kansas destination)			
58-60 U. S. Motor 437 e.p.	6.25 – 6.375	6.25 – 6.50	6.25 – 6.50
60-62 400 e.p. gasoline	6.75 – 7.00	6.75 – 7.00	7.00 – 7.125
64-66 375 e.p. gasoline	7.375– 7.50	7.375– 7.50	7.50
NORTH TEXAS			
48-52 450 e.p. naphtha	†6.00	†6.00	†6.00
56-58 450 e.p. gasoline	5.875	5.875	5.875
58-60 450 e.p. gasoline	5.875	5.875	5.875
58-60 U. S. Motor 437 e.p.	6.00	6.00 – 6.125	6.00 – 6.125
60-62 400 e.p. gasoline	6.375	6.375	6.375
64-66 390 e.p. gasoline	6.625	6.625	6.625
64-66 375 e.p. gasoline	6.875	6.75 – 6.875	6.75 – 6.875
68-70 350-360 e.p. gasoline	7.00 – 7.125	7.00 – 7.125	7.00 – 7.125
NORTH LOUISIANA (For Louisiana and differential territory destination)			
58-60 U. S. Motor gasoline	6.50	6.50	6.50
ARKANSAS (For Arkansas intrastate shipment)			
56-58 450 e.p. gasoline	6.25	6.25	6.25
58-60 450 e.p. gasoline	6.25	6.25	6.25
58-60 U. S. Motor 437 e.p.	6.50	6.375– 6.50	6.50 – 6.75
ARKANSAS (F. O. B. Arkansas refineries for interstate shipment)			
58-60 U. S. Motor 437 e.p.	**6.375	**6.375	**6.375– 6.625
CALIFORNIA			
*54-58 U.S. Motor 437 e.p.	7.00 – 8.50	7.00 – 8.50	7.00 – 7.50
*58-61 U.S. Motor 437 e.p.	7.50 – 9.50	7.50 – 8.50	7.50 – 8.50
*42-45 Eng. dis. 445-480 e.p.	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00

*2c tax to be added if used in state.

NATURAL GASOLINE

(Note: End point of all grades, not over 375° F. Since Oct. 1, 1927 all naturals must pass corrosion test.)

OKLAHOMA			
Grade AA, 80-87.9, 90% Recovery	†5.625	5.50 – 5.625	5.625– 5.75
Grade A, 72-79.9, 90% Recovery	†5.75 – 5.875	5.75 – 6.00	5.625– 5.75
Grade BB, 84-92, 85% Recovery	5.25	5.25	5.50 – 5.625
Grade B, 76-83.9, 85% Recovery	5.25	5.25	5.50 – 5.625
Grade C, 80-90, 78% Recovery	4.875– 5.00	5.00 – 5.125	5.50 – 5.625
NORTH TEXAS (F. O. B. Breckenridge)			
Grade AA, 80-87.9, 90% Recovery	†5.625	5.625	5.625– 5.875
Grade A, 72-79.9, 90% Recovery	†5.875– 6.00	5.875– 6.00	5.625– 5.875
Grade BB, 84-92, 85% Recovery	5.25	5.25	5.625
Grade B, 76-83.9, 85% Recovery	5.25	5.25	5.625
Grade C, 80-90, 78% Recovery	5.00	5.00 – 5.125	5.50 – 5.625
NORTH LOUISIANA (F. O. B. Monroe District)			
Grade AA	†6.375	†6.375– 6.50	†6.375– 6.50
Grade BB	† 6.00	†6.125	†6.125
Grade C	†5.625– 5.75	†6.125	†6.125
CALIFORNIA			
75-85, 375-390 e.p. blend.	9.50 –10.00	9.50 –10.00	9.50 –10.00

MOTOR FUEL BLENDS

PENNSYLVANIA			
68-70 Blend 437 e.p.	Prices	.....	.....
64-66 Blend 437 e.p.	temporarily	.....	.....
60-62 Blend 437 e.p.	discontinued	.....	.....
OKLAHOMA			
64-66 Blend 437 e.p.	6.00	6.00	6.00

BURNING OILS

PENNSYLVANIA			
45 w.w. kerosene	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75
46 w.w. kerosene	6.875– 7.25	6.875– 7.25	6.875– 7.25
47 w.w. kerosene	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50
OKLAHOMA			
41-43 w.w. kerosene	4.50 – 4.625	4.50 – 4.625	4.50 – 4.75
42-44 w.w. kerosene	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
KANSAS (F. O. B. refinery Kansas destination)			
41-43 w.w. kerosene	4.875– 5.25	4.875– 5.25	4.875– 5.25
42-44 w.w. kerosene	5.625– 5.75	5.625– 5.75	5.625– 5.75
NORTH TEXAS			
40-42 w.w. kerosene	†4.50	†4.50	†4.50
41-43 w.w. kerosene	†4.625– 4.75	†4.625– 4.75	†4.75
NORTH LOUISIANA (For Louisiana and differential territory destination)			
41-43 w.w. kerosene	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
ARKANSAS (For intrastate shipment only)			
42-44 kerosene	5.125– 5.25	5.125– 5.25	5.00 – 5.125
ARKANSAS (F. O. B. Arkansas refineries for interstate shipment)			
42-44 kerosene	5.00	5.00	4.75 – 5.00
CALIFORNIA			
38-40 w.w. kerosene	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50

NEUTRAL OIL

PENNSYLVANIA Vis.	Prices Nov. 28	Prices Nov. 21	Prices Nov. 14
(Viscosity at 70°F.)			
200 No. 3 Assoc. Filt.	32.00 –34.00	33.00 –34.00	33.00 –33.50
180 No. 3 Assoc. Filt.	29.00 –31.00	30.50 –31.00	31.00 –31.50
150 No. 3 Assoc. Filt.	26.25 –28.00	27.00 –28.00	26.50 –27.50
(Non Viscous)			
34 Grav. 330-340 Flash	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
36 Min. Neut. 300-305 Flash	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00
**OKLAHOMA Vis. Color (Viscosity at 100°F.)			
100—No. 2	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
150—No. 3	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
150—No. 4	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
180—No. 3	9.00 –10.00	9.00 –10.00	9.00 –10.00
180—No. 4	9.50 – 9.75	9.50 – 9.75	9.50 – 9.75
180—No. 5	9.25 – 9.75	9.25 – 9.75	9.25 – 9.75
200—No. 3	9.50 –11.00	9.50 –11.00	9.50 –11.00
200—No. 4	9.50 –10.75	9.50 –10.75	9.50 –10.75
200—No. 5	8.50 –10.50	8.50 –10.50	8.50 –10.50
220—No. 3	12.50 –13.50	12.50 –13.50	12.50 –13.50
220—No. 4	12.25 –12.50	12.25 –12.50	12.25 –12.50
220—No. 5	11.50 –12.00	11.50 –12.00	11.50 –12.00
240—No. 3	14.00	14.00	14.00
240—No. 4	13.25 –13.50	13.25 –13.50	13.25 –13.50
240—No. 5	12.00 –13.00	12.00 –13.00	12.00 –13.00
280—No. 3	15.50 –16.50	15.50 –16.50	15.50 –16.50
280—No. 4	15.25	15.25	15.25
280—No. 5	14.00 –15.00	14.00 –15.00	14.00 –15.00
300—No. 5-6	17.00	17.00	17.00
GULF COASTAL Vis. Color (Viscosity at 100° F., pour test 0)			
100—No. 2 Unfilt. Pale	6.50 – 7.00	6.50 – 7.00	7.00 – 7.50
200—No. 3 Unfilt. Pale	9.00 – 9.50	9.00 – 9.50	9.50 –10.00
300—No. 3 Unfilt. Pale	10.00 –10.50	10.00 –10.50	10.00 –11.00
500—No. 3½ Unfilt. Pale	12.00 –12.50	12.00 –12.50	12.00 –12.50
750—No. 4 Unfilt. Pale	14.00 –14.50	14.00 –14.50	14.50 –15.00
200—No. 5½ Red Oil	7.50 – 8.00	7.50 – 8.00	8.00 – 8.50
300—No. 5½ Red Oil	8.50 – 9.00	8.50 – 9.00	9.50 –10.00
500—No. 6 Red Oil	10.00 –10.50	10.00 –10.50	10.50 –11.00
750—No. 6 Red Oil	12.50 –13.00	12.50 –13.00	13.00 –13.50
CALIFORNIA Vis. Color (Viscosity at 100°F.)			
100—No. 2	9.00 – 9.50	9.00 – 9.50	9.00 – 9.50
100—No. 3	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00
200—No. 3	9.50 –10.00	9.50 –10.00	9.50 –10.00
300—No. 3	10.50 –11.00	10.50 –11.00	10.50 –11.00
450—No. 3-3½	13.00 –13.50	13.00 –13.50	13.00 –13.50
550—No. 3-3½	14.50 –15.00	14.50 –15.00	14.50 –15.00
600—No. 3-3½	15.00 –15.50	15.00 –15.50	15.00 –15.50
100—No. 5	6.50	6.50	6.50
200—No. 5	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
300—No. 5	9.00 – 9.50	9.00 – 9.50	9.00 – 9.50
400—No. 5	11.00 –11.50	11.00 –11.50	11.00 –11.50
500—No. 5	11.00 –11.50	11.00 –11.50	11.00 –11.50
600—No. 5	12.00 –12.50	12.00 –12.50	12.00 –12.50
700—No. 7	14.00 –14.50	14.00 –14.50	14.00 –14.50

CYLINDER STOCKS

**OKLAHOMA			
190-200 Vis. at 210° Brt. St.	31.00 –32.00	31.00 –32.00	31.00 –32.00
150-160 Vis. at 210° Brt. St.	23.00 –26.00	23.00 –26.00	23.00 –26.00
600 E St. 140-150 Vis.-210°	17.00 –18.00	17.00 –18.00	17.00 –18.00
600 St. Ref. Olive Green	9.00 –10.00	9.00 –10.00	9.00 –10.00
600 St. Ref. Dark Green	7.00 – 8.00	7.00 – 8.00	7.00 – 8.00
Black Oil	5.00	5.00	5.00
PENNSYLVANIA	(1-inch Immersion Test)		
600 Steam Refined	9.75 –10.50	9.75 –10.50	9.75 –10.50
650 Steam Refined	12.00 –13.00	12.00 –13.00	12.00 –13.00
600 Flash	15.00 –16.50	15.00 –16.50	15.00 –17.00
625 Flash	27.00 –28.00	27.00 –28.00	27.00 –28.00
600 Warren E	17.00 –19.00	17.00 –19.00	16.75 –17.50
600 Oil City E	15.75 –16.50	15.75 –16.50	15.50 –16.50
600 D Filtered	24.50 –25.50	24.50 –25.50	24.50 –25.50
Cold Test Stock, 40-50 p. p., 140-150 vis. at 210°, 540-550 flash, No. 8 color	29.50 –30.50	30.00 –31.00	30.00 –31.00
40-50 p.p., 140-150 vis. at 210, 540-550 flash, No. 6-6½ color diluted	27.50 –28.50	28.00 –29.00	28.50 –29.00

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon higher)

†PRICES NOMINAL ††ONLY ONE REFINER QUOTING *QUOTATIONS ONLY **REPRESENTS BOTH SALES AND QUOTATIONS

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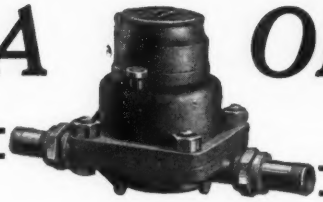

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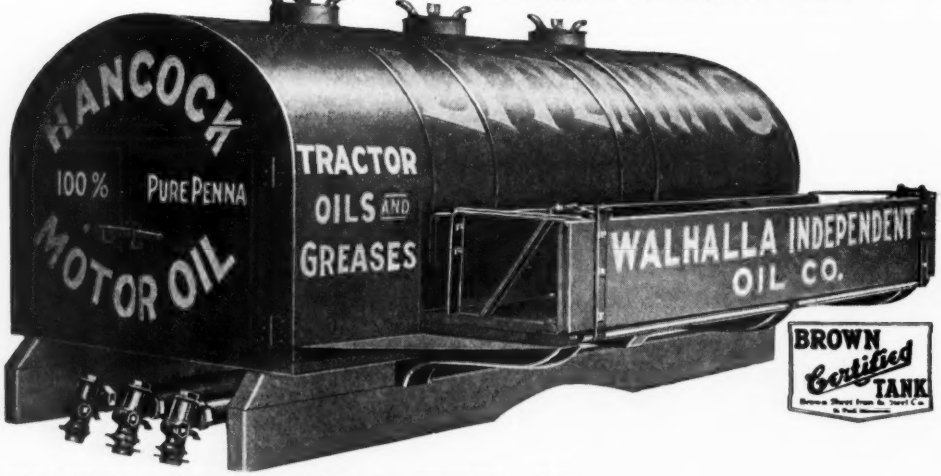

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Name..... Address.....

Refinery Markets on Wax and Heavy Oil Products

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

WAX

PENNSYLVANIA	Prices Nov. 28	Prices Nov. 21	Prices Nov. 14
*Per Pound, New York			
122-124 white crude scale	2.75 – 3.00	3.00 – 3.125	3.00 – 3.125
124-126 white crude scale	3.00	3.125	3.125
OKLAHOMA			
**124-126 Semi-refined..	2.50 – 2.75	2.55 – 2.75	2.55 – 2.75
CALIFORNIA			
White crude scale, per pound, ton lots.....	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50

FUEL OIL

PENNSYLVANIA			
36-40 fuel oil.....	4.50 – 4.75	4.50 – 4.75	4.625– 4.75
30-34 fuel oil.....	4.625– 4.75	4.625– 4.75	4.625– 4.75
28-32 fuel oil.....	4.625– 4.75	4.625– 4.75	4.625– 4.75
OKLAHOMA			
38-40 straw distillate.....	3.25 – 3.375	3.25 – 3.375	3.25 – 3.375
36-38 straw distillate.....	3.00	3.00	3.00
*32-36 gas oil, straw.....	†2.625	†2.625	†2.625
*32-36 dark gas oil.....	2.50 – 2.625	2.50 – 2.625	2.50 – 2.625
28-30 fuel oil (in bbls.)...	$0.925– 0.975	$0.925– 0.975	$0.925– 0.975
26-28 fuel oil (in bbls.)...	$0.875– 0.90	$0.875– 0.90	$0.875– 0.90
24-26 fuel oil (in bbls.)...	**$0.80– 0.825	**$0.85	**$0.85
22-26 fuel oil (in bbls.)...	**$0.775	**$0.80– 0.825	**$0.80– 0.825
18-22 fuel oil (in bbls.)...	**$0.725	**$0.725	**$0.725– 0.75
16-18 fuel oil (in bbls.)...	**$0.70– 0.725	**$0.70– 0.725	**$0.725
14-16 fuel oil (in bbls.)...	**$0.70– 0.725	**$0.70– 0.725	**$0.725

*Zero cold test low flash goods sell for ⅛ to ¼ cent more per gallon.
Zero cold test fuel oils sell for 5 to 15 cents more per bbl.

KANSAS (F. O. B. refinery Kansas destination.)			
38-40 straw distillate.....	3.50 – 3.75	3.50 – 3.75	3.50 – 3.75
36-38 straw distillate.....	3.25	3.25	3.25
32-36 gas oil.....	2.75 – 2.875	2.75 – 2.875	2.75 – 2.875
24-26 fuel oil	*$0.90 – 0.95	*$0.90– 0.95	*$0.95
18-22 fuel oil.....	*$0.85	*$0.85	*$0.85 – 0.90
NORTH TEXAS			
38-40 straw distillate.....	3.125– 3.25	3.125– 3.25	3.00 – 3.125
32-36 gas oil, cracked....	2.375– 2.50	2.375– 2.50	2.375– 2.50
32-36 gas oil, uncracked..	2.50	2.50	2 50
24-26 fuel oil (in bbls.)...	$0.80	$0.80 – 0.825	$0.85

GULF COASTAL	Prices Nov. 28	Prices Nov. 21	Prices Nov. 14
Fuel (in bbls.).....	$1.50 –$1.55	$1.50 –$1.55	$1.60 –$1.65
Gas oil.....	4.375– 4.50	4.375– 4.50	4.25 – 4.50
NORTH LOUISIANA (For Louisiana and differential territory destination)			
32-36 gas oil, dark.....	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
32-36 gas oil, straw.....	3.125– 3.25	3.125– 3.25	3.00 – 3.125
16-20 fuel oil (in bbls.) ...	$1.00	$1.00 – 1.05	$1.00 – 1.05
ARKANSAS (For Arkansas intrastate shipment only)			
32-36 gas oil.....	3.00	3.00	3.00 – 3.25
28-32 gas oil.....	2.75 – 3.00	2.75 – 3.00	2.875– 3.00
ARKANSAS (F. O. B. Arkansas refineries for interstate shipment)			
28-32 gas oil.....	2.75	2.75	2.75 – 2.875
Smackover crude fuel....	$0.975– 1.05	$0.975–$1.05	$1.10 – 1.15
CALIFORNIA (F. O. B. San Joaquin Valley. At San Francisco, 4c per bbl. more)			
14-18 fuel oil (in bbls.)...	$0.60 –$0.75	$0.65 –$0.75	$0.60 –$0.75
14-18 Bunker oil (in bbls.)	$0.85 –$1.00	$0.85 –$1.00	$0.85 –$1.00
30-34 gas oil (in bbls.)...	$1.00 –$1.05	$0.95 –$1.05	$0.95 –$1.05
27 Plus Diesel oil (in bbls.)	$0.85 –$1.00	$0.85 –$1.00	$0.85 –$1.00

PETROLATUMS

PENNSYLVANIA (In cents per pound in tank cars; in barrels, in car lots ¾c per pound more.)			
Snow White.....	9.25	9.25	9.25
Lily White.....	8.25	8.25	8.25
Cream White.....	7.25	7.25	7.25
Light Amber.....	5.50	5.50	5.50
Amber.....	4.50	4.50	4.50
Red.....	3.75	3.75	3.75
Green No. 5 color.....	3.50	3.50	3.50

**PETROLEUM COKE

(Per ton in car lots)			
Lump.....	$5	$5	$5
Still run.....	$3	$3	$3
Breeze.....	$2	$2	$2

†PRICES NOMINAL ††ONLY ONE REFINER QUOTING *QUOTATIONS ONLY **REPRESENTS BOTH SALES AND QUOTATIONS

better but not sufficiently good to cause any changes in prices. Gas oil also was in slightly better demand, but with the quantity of goods in the hands of refiners, and with numerous cracking units closed, the trade generally looks for no better prices for gas oil in the immediate future.

Fuel oils have been the hardest of all the major products to move from Oklahoma. This has been due partly to the competition from other areas, especially one or two plants in Kansas and Illinois. Small car lots for spot shipment have been going at prices shown in the price tables, but some large sales for over the month have been reported at 2.5 to 7.5 cents a barrel under the prevailing spot market. Two or three large refiners are known to have sold some of their output at lower prices for over the month, and played the spot market with the remainder.

Virtually the same situation exists in north Texas. One large refiner in Louisiana has been shoving out a considerable volume of fuel with the result prices have come down in that territory, but reports from there today indicated most of the stocks had been cleaned up.

Oklahoma neutral oil or cylinder stock prices were steady. Wax prices were slightly lower with business comparatively quiet. A few refiners were quoting 2.50 cents for 124-126 white crude scale goods, while others were asking up to 2.75 cents.

Pacific Coast Stocks Down 932,927 Bbls.

LOS ANGELES, Nov. 25.—Total stocks of crude oil and all other petroleum products in Pacific coast territory during October decreased 932,927 barrels, according to figures made public by the Pacific coast office of the American Petroleum Institute. Heavy crude, which includes all grades of fuel oil, increased 203,205 barrels to a total of 93,593,275. Total refinable crude stocks end of October were 21,841,747 barrels, representing withdrawal of 1,183,307 barrels. Gasoline stocks increased 355,467 barrels during the month. Stocks of distillates decreased 321,145 barrels.

During October, 61 new wells were completed in California, with a daily average plus reduction of 26,101 barrels. Nineteen dry holes were abandoned. At the end of the month, 332 wells were actively drilling, against 339 at close of September. California daily average production in October was 627,384 barrels, which was a decline of 8,099 barrels, from September figures.

Exports from Tampico District

Company	September	October
Transcontinental Petroleum Co. (Standard of New Jersey).....	838,788	503,100
Pan American Eastern Oil Co.....	1,989,852	1,624,491
Mexican Eagle Oil Co. (El Aguila).....	841,879	649,534
Cia. Mexicana Holandesa "La Corona".....	281,889	244,826
The Texas Company of Mexico, S. A.....	.....	86,895
Mexican Gulf Oil Co.....	.....	.....
Sinclair Mexican Companies.....	253,953	385,589
East Coast Oil Co. of Mexicom S. A. (Southern Pacific).....	.....	.....
Pierce Oil Corp.....	.....	28,551
Mexican Atlas Oil Co.....	74,745	51,695
La Espuela Oil Co.....	.....	.....
Moctezuma Terminal.....	.....	.....
Mexican Oil Products Co.....	22,657	20,123
New England Fuel Oil Co.....	43,492	60,829
Panuco Boston Oil Co.....	64,398	.....
Empire Gas & Fuel Co.....	46,501	64,410
Totals.....	4,458,154	3,720,043

Zero Fuels, Gas Oil, Distillate Demand Good in Chicago

Staff Special
CHICAGO, Nov. 26

FUEL oils continued in good demand in Chicago market this week, especially zero material. Zero gas oils and straw distillate also received a good play. Gasoline market remained at about same level as for past month.

Jobbers continued to enjoy good demand from oil burner owners. Jobbers were in market frequently. Industrial fuel oil demand was considerably better this week than for some time. Inquiries for five, 10 and 15 cars were numerous, according to reports received from nearly all quarters.

Most sellers reported their gasoline business about same this week as last. Nearly all orders were for small lots, rush shipment. Prices were generally unchanged throughout week except U. S. Motor declined slightly from Wednesday on. It sold at 6 to 6.125 cents until Wednesday when 5.875 cent sales were made frequently. Some U. S. Motor gasoline, for shipment to Ohio and Michigan points, was sold as low as 5.50 cents Group 3 freight basis, trade reported. Several Oklahoma refiners continued to quote 6.25 cents.

Higher gravity gasolines were in fair demand all week at generally unchanged prices. The 60-62, 437 e.p. grade sold at 6.25 to 6.375 cents up to Wednesday and at 6.25 cents the rest of the week. Gasoline 60-62, 400 e.p. grade moved at 6.50 to 6.625 cents all week. The 64-66, 375 e.p. sold mostly at 7c Monday and 6.875 to 7 cents the remainder of the week.

Kerosene was in fair demand. No great amount of material moved. Prices remained firm at 4.50 to 4.625 cents for the 41-43 grade.

Distillate continued to sell at same prices that have prevailed for some time. The 38-40 was in fairly good demand all week at 3.25 to 3.375 cents.

Gas oils with a zero cold test were in good demand. Trading in higher cold test goods was quiet. Prices were lower slightly. Ordinary dark 32-36 gas oil sold at 2.50 to 2.625 cents until Wednesday when most of it moved at 2.50 cents and market remained at this figure over the week. Considerable ordinary gas oil sales were reported at 2.375 cents. Dark zero 32-36 gas oil was in good demand although some moved at slightly lower prices. It was 2.75 cents until Wednesday and 2.625 to 2.75 cents thereafter. The 32-36 straw zero has been comparatively scarce; bulk of goods sold at 3 to 3.125 cents with some moving at 3.25 cents.

Fuel oil prices were generally unchanged all week. The 28-30 fuel sold at $1 to $1.05; one seller raised his price to $1.075 Saturday. Movement of 24-26 was mostly at $0.80 to $0.85, some going at lower prices. The 22-26 grade moved mostly at $0.80 to $0.825. The 18-22 fuel sold at $0.775 to $0.80 with some sales as low as $0.75. Quotations on Smackover crude fuel were lower during later half of week. Most of trade was quoting $1 to $1.025 at the close, although $1.025 to $1.05 prevailed earlier.

Occasional periods of precipitation will occur throughout next week in S. O. Indiana territory. Temperatures will be near normal most of week, becoming colder near close.

Eastern Kentucky Refinery Market

ASHLAND, Nov. 28.—Prices in eastern Kentucky refinery market were generally unchanged over past week, with the exception of 41-43 kerosene, which is down ¼ cent. Nov. 28 prices are:

60-62,	400-425 e.p. gasoline	9.125
64-66,	375-390 e.p. gasoline	9.25
41-43	kerosene	6.50
34-36	gas oil	4.625
24-26	fuel oil	3.25

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Week's Price Changes Tank Wagon Markets

Gasoline Changes

Standard of Indiana—T.w. and s.s. prices of gasoline reduced 3 cents, Mankato, to 14.1 cents and 16.1 cents respectively, including 2 cent state tax, **Nov. 22.**

* * *

Standard of Louisiana—T.w. price only of gasoline reduced 1.5 cents, Memphis, to 15 cents, including 3 cent tax. **Nov. 23.**

* * *

Kerosene Changes

Magnolia Petroleum—Kerosene prices advanced 1 cent, Oklahoma, to 10 cents t.w., Nov. 21.

Corrections

Price of Smackover crude fuel in Arkansas markets for interstate shipment was erroneously published at $0.975 to $1.025 in the Nov. 21 column of prices in the refinery table in the Nov. 23 issue, page 101. Price on Nov. 21 was $0.975 to $1.05, and is corrected in this issue.

* * *

In Pennsylvania cold test stocks quoted on page 99 of Nov. 23 issue the word "diluted" should have appeared after the No. 6-6½ color. This grade formerly was designated as "dark". Those unfamiliar with the significance of the word "diluted" should look at section 4 of method 10.2 in Technical Paper No. 323-A or at A.S.T.M. Method D155-23T.

Albany Gasoline Market Having Its Downs Again

ALBANY, N. Y., Nov. 28.—A survey of oil marketing conditions here reveals that about 75 per cent of gasoline sales in Albany are made at not over 13 cents retail a large marketer reports. No station has a posted price higher than 15 cents, which is the Standard's posted price also, and most of these stations are selling to commercial trade at 13 cents, this marketer states.

About one-third of the stations has no posted prices and another third has a 13 cent posted price, according to this marketer's findings.

The maximum tank wagon price is 13 cents, while gasoline has been offered as low as 10 cents from the tank wagon by two Independents with national distribution who have in addition offered to supply storage tanks to customers. In another instance one of these large marketers has offered 9½ cents at its drive-in filling stations to a commercial account, it is reported.

Tank Wagon, Service Station Markets for Gasoline and Kerosene In United States Territories and Canada

(As posted by principal marketing companies)

(OIL PRICE HANDBOOK has t.w. and s.s. markets for whole year arranged for quick reference)

These Prices In Effect November 28, 1927

S.O. NEW JERSEY TERRITORY

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
Atlantic City, N. J.	16	2	18	20	14
Newark, N. J.	16	2	18	20	14
Annapolis, Md.	16	4	20	23	12
Baltimore, Md.	16	4	20	23	10
Cumberland, Md.	16	4	20	23	14
Washington, D. C.	16	2	18	21	12
Danville, Va.	16	4½	20.5	*	14
Norfolk, Va.	16	4½	20.5	23.5	12
Richmond, Va.	14	4½	18.5	21.5	14
Roanoke, Va.	16	4½	20.5	23.5	14
Petersburg, Va.	16	4½	20.5	23.5	14
Charleston, W. Va.	16	4	20	23	14
Keyser, W. Va.	16	4	20	*	14
Parkersburg, W. Va.	13	4	17	20	14
Wheeling, W. Va.	16	4	20	23	14
Charlotte, N. C.	16	4	20	23	14
Hickory, N. C.	16	4	20	23	14
Mt. Airy, N. C.	16	4	20	23	14
Salisbury, N. C.	16	4	20	23	14
Charleston, S. C.	15	5	20	23	14
Columbia, S. C.	15	5	20	23	14

*Dealers set own prices. S. O. New Jersey does not operate station.

S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

*New York City	17	0	17	21	15
Albany, N. Y.	13	0	13	15	15
Buffalo, N. Y.	15	0	15	18	14
†Rochester, N. Y.	13	0	13	16	13
Syracuse, N. Y.	15	0	15	15	15
Boston, Mass.	17	0	17	18	15
Augusta, Me.	17	4	21	23	15
Manchester, N. H.	17	3	20	22	15
Burlington, Vt.	17	3	20	22	15

*In steel barrels.

†It is reported that S. O. New York is selling a second grade of gasoline at Rochester, 4c below the above posted prices which apply on its Socony grade.

ATLANTIC REFINING

Pittsburgh, Pa.	16	*	16	*22	14
Philadelphia, Pa.	15	*	15	*21	14
Allentown, Pa.	16	*	16	*22	14
Erie, Pa.	12	*	12	*18	14
Scranton, Pa.	16	*	16	*22	14
Altoona, Pa.	16	*	16	*22	14
Dover, Del.	16	3	19	22	14
Wilmington, Del.	16	3	19	22	14
Providence, R. I.	17	2	19	19	15
Boston, Mass.	17	0	17	17	15
Springfield, Mass.	17	0	17	17	15
Worcester, Mass.	17	0	17	17	15
Hartford, Conn.	19	2	21	22	15
New Haven, Conn.	19	2	21	21	15

*3-cent state tax is collected by retail dealer and paid by him directly to state.

S. O. KENTUCKY

Lexington, Ky.	13	5	18	21	15.5
Louisville, Ky.	13	5	18	21	15
Covington, Ky.	14	5	19	22	15.5
Clarksdale, Miss.	13	4	17	20	12.5
Gulfport, Miss.	††14.5	4	††18.5	21.5	14
Jackson, Miss.	13	4	17	20	13.5
Natchez, Miss.	12.5	4	16.5	19.5	14
Vicksburg, Miss.	12.5	4	16.5	19.5	14
Birmingham, Ala.‡	14	4	18	21	15.5
Mobile, Ala.‡	13	4	17	20	15
Montgomery, Ala.*‡	15	4	19	22	16.5
Atlanta, Ga.	12	4	16	18	†15.5
Augusta, Ga.	15	4	19	22	†16.5
Macon, Ga.	15	4	19	22	†16.5
Savannah, Ga.	13	4	17	19	†14.5
Jacksonville, Fla.°	13	5	18	21	14
Miami, Fla.°	15	5	20	23	15.5
Tampa, Fla.°	13	5	18	21	14
Pensacola, Fla.°	**14	5	**19	22	14

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included.

‡Alabama gasoline prices include 1/40 of 1c inspection fee, effective Oct. 1, 1927.

†Georgia kerosene prices include 1c state tax.

°Florida gasoline prices include ½c inspection fee.

**Both tank wagon prices include 1c city tax at Pensacola, which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

S. O. INDIANA

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
Chicago, Ill.	14	2	16	18	12
Decatur, Ill.	8.5	2	10.5	12.5	12.1
E. St. Louis, Ill.	13.1	2	15.1	17.35	11.2
Joliet, Ill.	14.4	2	16.4	18.4	12.3
Peoria, Ill.	10	2	12	12	12.1
Quincy, Ill.	14.2	2	16.2	18.2	11.9
Indianapolis, Ind.	11.2	3	14.2	15.2	13.2
Evansville, Ind.	14	3	17	19	13
South Bend, Ind.	12	3	15	15	13.4
Detroit, Mich.	12.8	3	15.8	17.8	13.7
Grand Rapids, Mich.	11	3	14	16	13.6
Saginaw, Mich.	14.9	3	17.9	19.9	13.8
Green Bay, Wis.	14.6	2	16.6	18.6	12.4
Madison, Wis.	14.3	2	16.3	18.3	12.1
Milwaukee, Wis.	14.1	2	16.1	18.1	11.9
La Crosse, Wis.	15.2	2	17.2	19.2	13
Minneapolis, Minn.	12	2	14	14	12.9
Duluth, Minn.	13.5	2	15.5	17.5	12.9
Mankato, Minn.	12.1	2	14.1	16.1	12.7
Des Moines, Ia.	14	3	17	19	12.3
Davenport, Ia.	12.5	3	15.5	17.5	12.3
Sioux City, Ia.	14.1	3	17.1	19.1	11.9
Mason City, Ia.	14.5	3	17.5	19.5	12.3
St. Louis, Mo.	*13.6	2	15.6	17.9	11.3
Kansas City, Mo.	†12.9	2	14.9	16.9	10.6
St. Joseph, Mo.	†12.5	2	14.5	16.5	11.2
Fargo, N. D.	13	2	15	17	14.9
Grand Forks, N. D.	17.2	2	19.2	21.2	15.2
Minot, N. D.	16.9	2	18.9	20.9	14.9
Pierre, S. D.	15.5	4	19.5	21.5	13.9
Huron, S. D.	12.5	4	16.5	18.5	13.9
Wichita, Kans.	12.8	2	14.8	16.8	10.8
Bartlesville, Okla.	12.8	3	15.8	17.8	10.8

S. O. Indiana's quantity discount schedule on tank wagon deliveries of gasoline outside the city of Chicago is 1c for 50 gals. or more at one delivery; 1½c for 6,000 gals. or more a month; 2c for 10,000 gals. or more a month, and 3c for 15,000 gals. or more a month.

In Chicago, above discounts apply, except that minimum required quantity to get the 1c discount is 100 gals., instead of 50 gals. This 1c discount applies on quantities of 100 gals. and over, in addition to regular Q.D.A. discounts applying thru rest of territory, as stated above.

Service station discount is 2c per gal. to consumers of 200 gals. or more a month, or 2400 gals. per year.

Discount on kerosene is 1c on 50 gal. dumps throughout territory.

*Includes city tax of ½c.

†Includes city tax of 1c.

S. O. NEBRASKA

Omaha, Neb.	14.25	2	16.25	16.25	12.25
McCook	12.75	2	14.75	16.75	11.50
Norfolk	14.75	2	16.75	18.75	12.75
North Platte	15.75	2	17.75	19.75	13.50
Scottsbluff	15.25	2	17.25	19.25	13.00

CONTINENTAL OIL

Denver, Colo.	13	3	16	16	12.5
Pueblo, Colo.	12	3	15	15	14.5
Grand Junction, Colo.	17.5	3	20.5	22.5	18
Casper, Wyo.	14	3	17	19	13
Cheyenne, Wyo.	15	3	18	20	14.5
Butte, Mont.	19	3	22	22	19
Helena, Mont.	19.5	3	22.5	24.5	19
Salt Lake City, Utah	17.5	3½	21	23	17
Boise, Ida.	19.5	4	23.5	25.5	19
Twin Falls, Ida.	19.5	4	23.5	25.5	19
Albuquerque, N. M.	16	5	21	24	17

S. O. CALIFORNIA*

Phoenix, Ariz.	19	4	23	27	21.5
Los Angeles, Cal.	13.5	3	16.5	20.5	15.5
Fresno, Cal.	14	3	17	21	16.5
San Francisco, Cal.	14	3	17	21	15.5
Reno, Nev.	18	4	22	26	19
Portland, Ore.	14.5	3	17.5	21.5	16.5
Seattle, Wash.	14.5	2	16.5	20.5	16.5
Spokane, Wash.	18.5	2	20.5	24.5	20.5
Tacoma, Wash.	14.5	2	16.5	20.5	16.5

*On Oct. 1, t.w. price at all points for spot sales, was advanced 1c. Very large portion of deliveries are under contract carrying above prices. New customers signing contracts and selling only one brand of gasoline, are given prices published in above table.

S. O. LOUISIANA

Little Rock, Ark.	11	5	16	16	12
Alexandria, La.	13	2	15	18	†14
Baton Rouge, La.	12	2	14	17	†12.5
Lake Charles, La.	13.5	2	15.5	18.5	†14
New Orleans, La.	13.5	2	*15.5	*17.5	†14
Shreveport, La.	13.5	2	15.5	18.5	†13
Lafayette, La.	13	2	15	18	†13.5
Bristol, Tenn.	16	3	19	22	14
Chattanooga, Tenn.	16.5	3	19.5	22.5	15
Knoxville, Tenn.	16.5	3	19.5	22.5	15
Nashville, Tenn.	15	3	18	21	15
Memphis, Tenn.	12	3	15	16.5	14

*New Orleans gasoline prices include 1c parish tax in addition to 2c state tax, and kerosene prices include 1c state tax and 1c parish tax.

†Kerosene price in Louisiana includes 1c state tax.

S. O. OHIO

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
All Ohio points	14	3	17	19	14

MAGNOLIA PETROLEUM

Muskogee, Okla.	12	3	15	18	10
Oklahoma City	10	3	13	14	10
Tulsa, Okla.	10	3	13	14	10
Fort Smith, Ark.*	13	*3	16	19	12
Little Rock, Ark.	11	5	16	16	12
Texarkana, Ark. *	12	*3	15	18	12
Dallas, Tex.	11	3	14	17	11
Fort Worth, Tex.	11	3	14	16	10
Houston, Tex.	10	3	13	15	15
San Antonio, Tex.	10	3	13	15	10
El Paso, Tex.	11	3	14	15	16

*Within City of Texarkana and Fort Smith, the state tax on gasoline is 3c per gal. conforming with the Texas state tax. In these two districts outside of the city the 5c Arkansas tax applies.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M. & P. Naphtha	Cleaner Naphtha
Chicago	16	18	18
Detroit	17.7	19.7	19.7
Kansas City	16.2	†18.2	†18.2
Milwaukee	16.7	*20.7	*20.7
Minneapolis	*20	*22	*22
St. Louis	15.9	17.9	17.9
New York	...	19	....

*Includes 2c state tax.

†Includes 1c city tax.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
Toronto	19.5	3	22.5	26	21
Ottawa	19.5	3	22.5	26	21
Cochrane	24.5	3	27.5	36	26
Ft. William	24.5	3	27.5	31	23.5

MANITOBA

Winnipeg	24.5	3	27.5	31	23.5

SASKATCHEWAN

Regina	27.5	0	27.5	32	26.5

ALBERTA

Edmonton	26.5	3	29.5	33	25.5
Calgary	22.5	3	25.5	29	23.5

BRITISH COLUMBIA

Vancouver	21	3	24	28	22

QUEBEC

Montreal	20.5	3	23.5	27	21
Quebec City	22.5	3	25.5	31	23
Three Rivers	22.5	3	25.5	30	23

NEW BRUNSWICK

St. John	24.5	3	27.5	32	24
Moncton	24.5	3	27.5	32	24

NOVA SCOTIA

Halifax	24.5	3	27.5	32	24
Sydney	24.5	3	27.5	32	24

PRINCE EDWARD ISLAND

Charlottetown	24.5	3	27.5	31	24

Note: In districts surrounding these points 1c additional is added to city price.

Gasoline Prices Advance ¼ Cent In Eastern Markets

Staff Special
NEW YORK, Nov. 26

ADVANCING prices were again the outstanding feature in eastern seaboard markets during past week. Gasoline prices today stood approximately 0.25 cent higher than last Saturday at majority of points along Atlantic coast. Spot gasoline movement for the most part was good and contract commitments were taken out regularly.

At Baltimore and Philadelphia minimum of 8.25 cents was being quoted for U. S. Motor gasoline in tank cars. Several refiners who first advanced their prices from 8 cents to 8.25 cents reported business had been sufficiently good at the new price to warrant their raising it and additional 0.25 cent. A Baltimore refiner asserted he had booked something like 200 cars of U. S. Motor gasoline as market was advancing. He has advanced his quotation to 8.50 cents.

In New York, end of week found a number of dealers still debating as to whether or not they would advance their prices. Several larger refiners were asking 8.25 to 8.50 cents for U. S. Motor gasoline. One or two refiners continued to offer goods at 8 cents. Several resale agents had material bought ahead which they were willing to sell at this price.

Retal marketing conditions in New England district were somewhat improved. In upstate New York low prices were bobbing up occasionally, especially in vicinities of Syracuse and Albany.

Kerosene markets showed no material change over the week. Water white goods at New York harbor sold largely at 7 to 7.50 cents. Philadelphia refiners continued to get minimum of 7.25 cents for this grade. Prices advanced 0.25 cent in New England district. Only one refiner in this district has any water white kerosene to offer.

Burning oils were in better demand in New England. Gas oil, 28-32 gravity still is offered at 4.50 cents by one refiner in this section. At New York, gas oil is quoted at a minimum of 4.75 cents.

Atlantic coast bunker markets posted prices were unchanged. Grade C was $1.40 at New York harbor, and at other points also stationary.

Large Number Light Oil Cargoes Sold in Gulf Market

NEW YORK, Nov. 26

A GENERALLY better tone was noted in market for light oils at Gulf this week. Foreign buyers were active. Number of cargo transactions were closed involving large quantities of high gravity gasoline and kerosene. Heavy oils showed a marked decline. Bunker markets were fairly steady. Quotations for spot cargoes of light oils did not show any appreciable change.

A number of inquiries were in market for goods for forward delivery. Refiners who have shown any inclination to commit themselves in advance of 60 days have quoted from 0.125 to 0.25 cent higher for this business. For most part refiners have been reluctant to take on business for delivery any further ahead than February but in one or two instances transactions of this nature have been closed.

A sufficient volume of business was done this week so that what appeared to be a scarcity of spot offerings developed. As week ended, only one refiner was offering any goods for December loading, all others having withdrawn from the December market for the present. One large supplier is said to have around 40 cargoes of oil scheduled for loading in the next 60 days.

Current demand has been largely for high gravity gasoline. By virtue of relative scarcity of this goods, suppliers are using it as a selling medium for U. S. Motor.

Spot cargo sales reported this week were made largely at 7 cents for U. S. Motor gasoline, 8.25 cents for 64-66, 375 end point gasoline, 7 cents for water white and 6 cents for prime white kerosene. A 32,000 barrel cargo of of U. S. Motor and 64-66, 375 end point gasoline sold today to a Roumanian buyer at 7.25 cents and 8.50 cents, respectively for last half of December shipment from north of Hatteras.

Inquiry for approximately 42,000 barrels of French specification gas oil was still in market this week. German buyer also was inquiring for full cargo of transparent goods. No gas oil transactions were reported closed this week; quotations were unchanged largely with suppliers asking 4.25 cents for 26-28 gravity, and 4.25 to 4.50 cents for higher gravity material.

Fuel oil market at Gulf quotations were off approximately 5 cents per barrel. Grade C in cargo lots was offered at $1.05 latter part of this week. Market for bunkers was fairly steady at $1.20 to $1.30.

White crude scale was generally unchanged at New Orleans. Market was rather quiet this week. No important sales were reported.

Available Bureau Mines Film List Announced

BARTLESVILLE, Okla., Nov. 26.—U. S. Bureau of Mines announces a list of motion picture films now in stock at the Bartlesville station, which will be loaned, free of charge, to any who desire to use them.

Borrowers are required to give best possible care to films and to be responsible for all damage other than nominal wear and tear. All transportation charges on the films, and cost of telegrams relating to them, are to be paid by the borrower.

First class projection machines and competent operators must be provided and the borrower, in asking for a film, should make also his alternate choice, to reach the station two weeks before date of showing, if possible. Films must be reshipped to the station on the date specified, although permission may be granted to retain film longer than first contemplated, if there are not too many others waiting and if the request is made prior to reshipping date.

The list of films in stock is as follows:

Film No.	Title
71	The Story of Sulfur—2 Reels.
74	The Story of Asbestos—3 Reels.
78	The Story of Heavy Excavating Machinery—4 Reels.
88	Water Power—1 Reel.
89	Transportation—2 Reels.
90	The Story of a V-Type Eight Cylinder Motor—3 Reels.
93	The Story of Alloy Steel—4 Reels.
96	The Story of a Motor Trunk—3 Reels.
97	The Story of Fire Clay Refractories—4 Reels.
99	The Story of Gasoline—3 Reels.
100	The Story of a Storage Battery—2 Reels.
102	The Story of the Heat Treatment of Steel—2 Reels.
106	The Story of a Spark Plug—2 Reels.
109	The Story of Lead Mining and Milling—3 Reels.
110	The Story of a Rotary Drilled Oil Well—2 Reels.
111	The Story of Power—3 Reels.
112	The Story of Lead Smelting—2 Reels.
113	Through Oil Lands of Europe and Africa—Germany, France, Spain, Morocco, and Algeria—2 Reels.
114	Through the Oil Lands of Europe and Africa—Italy, Hungary, the Danube, and Roumania—3 Reels.
115	Through Oil Lands of Europe and Africa—Poland, Greece and Egypt—4 Reels.
116	The Story of Dynamite—2 Reels.
120	The Story of Lubricating Oil—2 Reels.
122	The Story of a Mexican Oil Gusher—2 Reels.
123	The Story of Lubrication—1 Reel.
124	The Story of an Electric Detonator—1 Reel.

Complete Seaboard Market

(Export markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the years 1924-1925-1926)

Eastern Domestic Market

(Prices for tank car lots, f.o.b. refinery or seaboard terminal, represent majority of quotations and sales.)

	Nov. 28	Nov. 21	Nov. 14
U.S. Motor gasoline, New York harbor	8.00 – 8.50	8.00 – 8.25	8.00
U.S. Motor gasoline, Philadelphia	8.25 – 8.50	8.00 – 8.50	7.875– 8.00
U.S. Motor gasoline, New England	8.00 – 8.25	8.00 – 8.25	7.875– 8.00
U.S. Motor gasoline, Baltimore	8.25 – 8.50	8.00 – 8.25	7.875– 8.00
U.S. Motor gasoline, Norfolk	8.25 – 8.50	8.00 – 8.25	8.00
U.S. Motor gasoline, Wilmington	†8.50	†8.00	†8.00
U.S. Motor gasoline, Charleston	7.75 – 8.00	7.75 – 8.00	7.75
U.S. Motor gasoline, Savannah	7.50 – 7.75	7.50	7.50
U.S. Motor gasoline, Jacksonville	7.50 – 7.75	7.50	7.50
California U.S. Motor gasoline, Baltimore	8.50	8.50	8.00
California U.S. Motor gasoline, Philadelphia	8.50	8.50	8.00
Water white kerosene, New York harbor	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
Water white kerosene, Philadelphia	7.25	7.25	7.25 – 7.50
Water white kerosene, Baltimore	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
Water white kerosene, New England	7.25	7.25	7.00
28-34 gas oil, New York harbor	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
28-34 gas oil, New England	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
38-42 furnace oil, New York harbor	6.00	6.00	6.00
36-40 furnace oil, New England	6.00	6.00	6.00 – 6.25
Grade C bunker oil, New York harbor	$1.40	$1.40	$1.45
Grade C bunker oil, New England	$1.45	$1.45 –$1.50	$1.50 –$1.55
Diesel oil, New York harbor	$2.10	$2.10	$2.10
MEDICINAL OILS			
Russian 885-890 s.g., 325-330 vis.	$0.80 –$0.90	$0.80 –$0.90	$0.80 –$0.90
Russian 870-875 s.g., 150-155 vis.	$0.67 –$0.77	$0.67 –$0.77	$0.67 –$0.77
Russian 860-865 s.g., 80-85 vis.	$0.65 –$0.75	$0.65 –$0.75	$0.65 –$0.75

†Only one refiner quoting.

New York Export Market

(Gasoline and kerosene in cases in bulk. Lubricating oils are all Penna. products, prices per gal. in bbls.)

	Nov. 28	Nov. 21	Nov. 14
U. S. Motor gasoline	23.90	23.90	23.90
43-45, 150 w.w. kerosene	18.15	18.15	18.15
42-44, 110 s.w. kerosene	17.15	17.15	17.15
CYLINDER OILS			
Bright stock, dark	35.00 –36.00	36.00 –37.00	36.00 –37.00
600 D filtered	30.00 –31.00	30.00 –31.00	30.00 –31.00
600 Warren E filtered	25.00	25.00	25.00
600 s.r. unfiltered	17.00 –17.50	17.00 –17.50	17.00 –17.50
650 s.r. unfiltered	18.50	18.50	18.50
600 flash s.r.	20.00	20.00	20.00
630 flash s.r.	31.00 –33.00	31.00 –33.00	31.00 –33.00
RED ENGINE OILS (Vis. 100°)			
300 vis. No. 6½ color	20.00	20.00	20.00
250 vis. No. 6 color	19.00	19.00	19.00
200 vis. No. 6 color	18.50	18.50	18.50
PALE ENGINE OILS (Vis. 100°)			
230 vis. No. 3¾ color	24.00	24.00	24.00
180 vis. No. 3¼ color	20.00	20.00	20.00
100 vis. No. 2¾ color	15.75	15.75	15.75
MOTOR OILS (Vis. 100°)			
600 vis. No. 7 color	35.00	35.00	35.00
500 vis. No. 6½ color	33.00	33.00	33.00
400 vis. No. 7¼ color	31.00	31.00	31.00
300 vis. No. 6 color	30.00	30.00	30.00
200 vis. No. 3¼ color	24.00	24.00	24.00
MEDICINAL OILS			
875-885 s.g.	$0.80	$0.80	$0.80
865-870 s.g.	$0.70	$0.70	$0.70

WAXES (In cents per pound, f.a.s. carload lots)

WHITE CRUDE SCALE (In barrels)

	Nov. 28	Nov. 21	Nov. 14
122-124 A.m.p.	2.625– 2.75	2.75 – 2.875	3.00
124-126 A.m.p.	2.625– 2.75	2.75 – 2.875	3.00
FULLY REFINED (In burlap bags)			
123-125 A.m.p. Phila.	3.75	3.75 – 4.00	3 80 – 4.00
125-127 A.m.p.	3.75	3.75 – 4.00	3.80 – 4.00
128-130 A.m.p.	3.875– 4.125	3.875– 4.125	4.00 – 4.25
130-132 A.m.p.	4.375– 4.50	4.375– 4.50	4.50
133-135 A.m.p.	*5.50	*5.50	*5.50
135-137 A.m.p.	*5.75 – 6.00	*5.75 – 6.00	*5.75 – 6.00
YELLOW CRUDE SCALE			
124-126 A.m.p.	2.625	2.65	2.75

***Prices nominal.**

Gulf Export Market

(F.O.B. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. and over, except where otherwise noted.)

GASOLINE	Nov. 28	Nov. 21	Nov. 14
U. S. Motor	7.00 – 7.25	7.00 – 7.125	7.00
61-63, 390 e.p.	8.00	8.00	8.00
64-66, 375 e.p.	8.25	8.25	8.25
U. S. Motor, cases (cargoes)	$1.60	$1.60	$1.60
64-66, cases (cargoes)	$1.75	$1.75	$1.75
KEROSENE			
44 water white	7.00	7.00	7.00 – 7.25
41-43 prime white	6.00	6.00	6.00 – 6.25
Water white, cases (cargoes)	$1.60	$1.60	$1.60
Prime white, cases (cargoes)	$1.50	$1.50	$1.50
DOMESTIC GAS & BUNKER OILS			
*26-28 gas oil	4.25	4.125– 4.25	4.125– 4.25
*30-32 gas oil	4.25 – 4.50	4.25 – 4.50	4.25
Grade C bunker oil	$1.20 –$1.30	$1.20 –$1.30	$1.20 –$1.30
Grade C bunker oil, cargoes	$1.05 –$1.10	$1.10 –$1.15	$1.10 –$1.15

***Translucent thru neck of 4 oz. bottle.**

MEXICAN CRUDE AND BUNKER OILS (F.O.B. Steamer, Tampico)

Heavy Panuco crude taxes to be paid	$1.10	$1.05 –$1.10	$1.05 –$1.10
Grade C bunker oil, for bunkering purposes, taxes paid	$1.35	$1.35	$1.35

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100° F.; cold test 0) (Tanker, f.o.b. Houston)

100 vis. No. 2 unfiltered pale	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
200 vis. No. 3 unfiltered pale	8.00 – 9.00	8.00 – 9.00	8.00 – 9.00
300 vis. No. 3 unfiltered pale	9.00 –10.00	9.00 –10.00	9.00 –10.00
500 vis. No. 3½ unfiltered pale	11.00 –11.50	11.00 –11.50	11.00 –11.50
200 vis. No. 5½ red oil	7.00 – 7.50	7.00 – 7.50	7 00 – 7.50
300 vis. No. 5½ red oil	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
500 vis. No. 6 red oil	10.00	10.00	10.00

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Nov. 28	Nov. 21	Nov. 14
Gasoline, U. S. Motor, 53-55 Gravity	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
Gasoline, U. S. Motor, blends and special cuts	7.00 – 8.00	7.00 – 8.00	7.00 – 8.00
Gas Oil, 30-34, per barrel	$1.00 –$1.05	$0.95 –$1.05	$0.95 –$1.05
Diesel Oil, 27 plus, per barrel	$0.85 –$1.00	$0.85 –$1.00	$0.85 –$1.00
Bunker oil, 14-18, per barrel	$0.80 –$1.00	$0.80 –$1.00	$0.80 –$1.00
Fuel oil, 14-18, per barrel	$0.75 –$1.00	$0.75 –$1.00	$0.75 –$1.00
Kerosene, 38-40 w.w., 125-150 flash, per gal.	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
Cased Goods			
Gasoline, U. S. Motor	$1.70 –$1.80	$1.70 –$1.80	$1.70 –$1.80
Kerosene, 38-40 w.w., 251-150 flash	$1.35 –$1.50	$1.35 –$1.50	$1.35 –$1.50

Crude Oil Prices, as Posted by Major

(Crude prices for years 1924-1925-1926 in

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District)	$2.65
Bradford District Oil in National Transit Lines (Bradford District)	2.65
Penna. Grade Oil in National Transit Lines (Other Pennsylvania)	2.55
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)	2.55
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)	2.50
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)	2.25
Keister Grade in National Transit Lines (Butler Co.)	1.10
Cabell Grade in Eureka Pipe Lines (West Virginia)	1.40
Corning Grade in Buckeye Pipe Lines (Ohio)	1.45
Corning, O. heavy grade	1.35
*Somerset Oil in Cumberland Pipe Lines (Kentucky)	1.50
Ragland Grade in Cumberland Pipe Lines (Kentucky)	.95

*Somerset oil run prior to Oct. 1922, takes price of 6 cents lower than above quotations.

(Posted by Stoll Oil Refining Co.)

Oil City, Ky., oil in Stoll lines.....$1.50

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Effective March 14, 1927

Wooster	$1.57	Plymouth	$1.33
Lima	1.71	West. Kentucky	1.33
Waterloo	1.35	*Canadian Petro.	2.11
Indiana	1.48	*Oil Springs	2.18
Princeton	1.60	*Posted by Imperial Oil Ltd.	
Illinois	1.60		

OKLAHOMA, KANSAS And NORTH TEXAS

Prices of Prairie Oil & Gas Co.

(In Oklahoma, Kansas, North and East Central Texas)

Effective March 12, 1927

28-28.9	$1.12	35-35.9	$1.26
29-29.9	1.14	36-36.9	1.28
30-30.9	1.16	37-37.9	1.30
31-31.9	1.18	38-38.9	1.32
32-32.9	1.20	39-39.9	1.34
33-33.9	1.22	40-40.9	1.36
34-34.9	1.24	41-41.9	1.38
42-42.9	$1.40	48-48.9	$1.52
43-43.9	1.42	49-49.9	1.54
44-44.9	1.44	50-50.9	1.56
45-45.9	1.46	51-51.9	1.58
46-46.9	1.48	52 and above	1.60
47-47.9	1.50		

Above schedule met on March 12, by Gulf, Mid-Continent Pet. Corp., and Empire; by Carter, Humble and The Texas Co. on March 14.

Humble Oil & Refining Co. Prices
(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)

March 14, same schedule as Prairie in above fields, except these grades posted Nov. 16:

Below 25	$0.90	26-26.9	$1.08
25-25.9	1.06	27-27.9	1.10
Mirando, Tex.			$1.00

Magnolia Petroleum Co.
(In Oklahoma, Kansas and North and East Central Texas)

Effective Sept. 14, Magnolia posted same price schedule as Prairie in above fields, in Panola Co. and Iatan, Tex. district, except that Magnolia is paying $1.05 for all oil below 30 gravity.

Glasscock County	$0.80
Corsicana heavy	$1.00

Carter Oil Co.
(Oklahoma and Kansas)

March 14, same schedule as Prairie.

PANHANDLE, TEXAS
Humble Oil & Refining Co.

Effective Aug. 23

Hutchinson, Carson and Wheeler Counties..$0.75
Pampa, Gray County, Effective March 14:

28-28.9	$ .80	37-37.9	$ .98
29-29.9	.82	38-38.9	1.00
30-30.9	.84	39-39.9	1.02
31-31.9	.86	40-40.9	1.04
32-32.9	.88	41-41.9	1.06
33-33.9	.90	42-42.9	1.08
34-34.9	.92	43-43.9	1.10
35-35.9	.94	44 and above	1.12
36-36.9	.96		

WEST TEXAS
Humble Oil & Refining Co.

Effective Aug. 23

Crane, Upton, Crockett and Pecos Counties...$0.60

NORTH LOUISIANA — ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton and De Soto

Effective March 14, 1927

Below 28	$1.10	40-40.9	$1.36
28-28.9	1.12	41-41.9	1.38
29-29.9	1.14	42-42.9	1.40
30-30.9	1.16	43-43.9	1.42
31-31.9	1.18	44-44.9	1.44
32-32.9	1.20	45-45.9	1.46
33-33.9	1.22	46-46.9	1.48
34-34.9	1.24	47-47.9	1.50
35-35.9	1.26	48-48.9	1.52
36-36.9	1.28	49-49.9	1.54
37-37.9	1.30	50-50.9	1.56
38-38.9	1.32	51-51.9	1.58
39-39.9	1.34	52 and above	1.60

*Smackover, below 24	$0.85
* do 24 and above	1.00
Bellevue	1.25
Cotton Valley	1.00
**Urania, La	.75
†East El Dorado	1.00

**Posted by Louisiana Oil Refining Corp.

†Posted by Magnolia Petroleum Co.

*Smackover prices posted on Nov. 21 by S. O La., Gulf, Shreveport-El Dorado Pipe Line, Atlantic Oil Producing Co. and Magnolia Pet Co.; on Nov 19 by La. Oil Refg. Corp.; on Nov. 23 by The Texas Co.

STEPHENS, ARKANSAS

Atlantic Oil Producing Co. and Louisiana Oil Refining Corp.

Below 28	$1.00	30-30.9	$1.06
28-28.9	1.02	31-31.9	1.08
29-29.9	1.04	32 and above	1.10

GULF COASTAL

Posted by Humble Oil & Refining Co.

Effective March 14

Grades A	$1.20	29-29.9	$1.25
Grades B:		30-30.9	1.27
Below 25	1.15	31-31.9	1.29
25-25.9	1.17	32-32.9	1.31
26-26.9	1.19	33-33.9	1.33
27-27.9	1.21	34-34.9	1.35
28-28.9	1.23	35 and above	1.37

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia, Orange, Boling and Pierce Junction. All other fields are Grades A only.

Gasoline Buyers in Market, Cannot Agree on Prices

LOS ANGELES, Nov. 26

BUYERS are in market ready to make spot purchases in volume —but at a price. This price is not in line with what the refiners think their products are worth. During the past week a number of inquiries have been received on prices for gasoline for export. Buyers want to buy at 5.625 to 5.875 cents. Refiners are asking 6 cents and slightly higher. Major refiners mainly are quoting 6 cents for off shore gasoline. Present asking price at Los Angeles harbor is 6 cents. Tanker rate to East coast in a chartered boat is 60 to 65 cents.

Most Independent refiners refuse to sell in tank car lots at less than 7.50 cents, several are asking higher prices up to 9 cents; prices are without tax, for shipments to points outside of state. Some two to three weeks ago some gasoline in this trade was available at 7 cents.

Gas oil is scarce and higher. Low quotations this week on the uncracked product was $1, as against 95 cents last week. It is reported that some refiners are beginning operations at their cracking units, and using their gas oil as charging stock. It is also reported that the Shell Co. now is cracking most of its gas oil and fuel and that there is a possibility that Shell will come into the market this winter to buy fuel to fill their contracts. Shell Co. had the contract to supply requirements of the Cunard steamship line. This contract has been recently awarded to Standard of New Jersey. Tank car quotations on fuel are around 65 to 70 cents. Most small refiners are asking 70 cents.

For past several weeks, spot crude commanded about 10 cents premium. This premium has been reduced during past two weeks. One contract was offered this week at 10 cents premium, delivered at ship board. Previous premium asked was 10 cents at the well.

* * *

Los Angeles Shipments

LOS ANGELES, Nov. 26.—Total of 1,292,728 barrels of petroleum products left Los Angeles harbor in tankers during week ended Nov. 19, for points outside of Pacific coast trade territory. This was a daily average movement of 184,675 barrels, and compares with a total of 1,121,-249 barrels, or a daily average of 160,178 barrels, for the past week.

Of total movement, Atlantic domestic drew 310,364 barrels of crude, 72,154 barrels of fuel, 256,059 barrels of gasoline and 92,427 barrels of kerosene. Shipments to Atlantic foreign was composed of 165,160 barrels of fuel, and 83,701 barrels of gasoline. The remainder of the total went to Pacific foreign.

Purchasers, in All Fields (in Effect November 28)

OIL PRICE HANDBOOK published annually)

GULF COASTAL
Prices of The Texas Co.
(Effective March 14)

Grades A	$1.20	*Grades B	$1.15
‡Grades B (light crude):			
35-35.9	$1.37	38-38.9	$1.43
36-36.9	1.39	39-39.9	1.45
37-37.9	1.41	40 and above	1.47

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS
Prices of Ohio Oil Co. and Midwest Refining Co.
(Salt Creek prices effective March 12)

‡Salt Creek 29-29.9	$1.14
" " 30-30.9	1.16
" " 31-31.9	1.18
" " 32-32.9	1.20
" " 33-33.9	1.22
" " 34-34.9	1.24
" " 35-35.9	1.26
" " 36-36.9	1.28
" " 37 and above	1.30
Elk Basin	1.33
Grass Creek light	1.33
Big Muddy	$1.25
Lance Creek	1.33
Rock Creek	1.25
Mule Creek	1.30
Rex Lake	1.10
‡Osage	1.33
‡Cat Creek, Mont.	1.33
Sunburst, Mont.	1.35
‡Hogback, N. Mex.	1.38
Artesia, N. Mex.	1.00

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

The Texas Co. buys Salt Creek and Big Muddy crude.

CALIFORNIA
Standard Oil Co. of California

Santa Maria and Ventura Posted by Union Oil Co.

Gravity	Signal Hill Seal Beach Huntington Beach	Inglewood Torrance	Whittier La Habra	Newhall, McKittrick, Kern River	Olinda-Brea Canon, Richfield	Athens-Rosecrans Dominguez	Montebello	Coyote Hills	Santa Fe Springs	Midway Sunset Buena Vista & Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria	Ventura
14-14.9	$ .85	$ .85	$ .85	$ .75	$ .85	....	$ .85	$ .85	....	$ .75	$ .75	$ .75	$ .75	$ .85	$ .85
15-15.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
16-16.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
17-17.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
18-18.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
19-19.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
20-20.9	.85	.85	.85	....	.85	....	.85	.85	....	.77	.77	.76	.76	.85	.85
21-21.9	.86	.86	.85	....	.86	....	.85	.86	....	.79	.79	.77	.77	.85	.85
22-22.9	.87	.87	.85	....	.87	....	.85	.87	....	.81	.81	.78	.78	.85	.85
23-23.9	.88	.88	....	....	.88	....	.85	.88	....	.83	.83	.79	.79	.85	.85
24-24.9	.89	.89	....	....	.89	$ .89	.85	.89	.85	$ .85	.85	.80	.80	.85	.85
25-25.9	.90	.90	....	....	.90	.90	.86	.90	.85	.87	.87	.81	.81	.86	.86
26-26.9	.92	.92	....	....	.92	.92	.87	.91	.85	.89	.89	.83	.82	.87	.87
27-27.9	.94	.94	....	....	.94	.94	.88	.92	.85	.91	.91	.85	.83	.88	.88
28-28.9	.96	.96	....	....	.96	.96	.89	.93	.86	.93	.93	.87	....	.89	.89
29-29.9	.98	....	....	....	.98	.98	.90	.94	.87	.96	.96	.89	....	.91	.91
30-30.9	1.00	....	....	....	1.00	1.00	.91	.95	.88	.99	.99	.91	....	.93	.93
31-31.9	1.03	....	....	....	....	1.03	....	....	.89	1.02	1.02	.93	....	....	.95
32-32.9	1.06	....	....	....	....	1.06	....	....	.91	1.05	1.05	.95	....	....	.97
33-33.9	....	....	....	....	....	1.09	....	....	.93	1.08	1.08	.97	....	....	.99
34-34.9	....	....	....	....	....	1.12	....	....	.95	....	1.11	.99	....	....	1.01
35-35.9	....	....	....	....	....	1.15	....	....	.97	....	....	1.01	....	....	1.03
36-36.9	....	....	....	....	....	1.18	....	....	.99	....	....	....	....	....	1.06
37-37.9	....	....	....	....	....	1.21	....	....	1.01	....	....	....	....	....	1.09
38-38.9	....	....	....	....	....	1.24	....	....	1.03	....	....	....	....	....	1.12
39-39.9	....	....	....	....	....	1.27	....	....	1.06	....	....	....	....	....	1.15
40-40.9	....	....	....	....	....	1.30	....	....	1.09	....	....	....	....	....	....
41-41.9	....	....	....	....	....	1.33	....	....	1.12	....	....	....	....	....	....
42-42.9	....	....	....	....	....	1.36	....	....	1.15	....	....	....	....	....	....

*Union Oil Co. also purchases Long Beach Crude and is maintaining the same gravity and price schedule in that field as the Standard maintains in Signal Hill and Huntington Beach fields. The Union also buys and pays the same prices as the Standard in the Rosecrans-Dominguez fields, on gravities ranging from 14 degrees to and including 24.9 degrees and in Santa Fe Springs, on gravities ranging from 20 to and including 23.9 degrees.

Oil Companies May Lose Right to Use Radio

Staff Special

TULSA, Nov. 28.—The Federal Radio Commission has called operators of privately owned commercial radio stations in the United States to appear at a hearing at Washington on Jan. 3 to show cause why their licenses should not be revoked. **The proposed cancellation would affect 11 oil companies which operate** 30 stations.

The Skelly Oil Co., one of the pioneer users of radio, has suggested a meeting of oil interests to arrange a defense. G. A. R. Slocum, sales manager for Skelly, who is in charge of that company's radio stations, is posting letters urging a meeting.

Companies using radio for communication include the Illinois Pipe Line Co., Phillips Petroleum Co., The Texas Co., Skelly Oil Co., Magnolia Petroleum Co., Humble Oil & Refining Co., General Petroleum Corp., Associated Oil Co., Gulf Refining Co., and the Chilkat Oil Co., Kalall, Alaska. The oil companies have found radio a great aid in communication with new fields as well as a great saver of telegraph tolls.

Oil companies now are operating under temporary licenses. Former licenses expired about six months ago and the radio commission refused regular renewals. To obtain even temporary permits the companies were forced to relinquish all claims on any particular frequency or wave length.

N. Y. Wax Market Lower Than Gulf

NEW YORK, Nov. 26.—Further recessions in prices for white crude scale were noted in the New York wax market this week. Fully refined grades, particularly those with high melting points, were fairly steady. Low melting point grades were down approximately 0.25 cent from high range of last week.

New York prices for first time in many months fell below New Orleans market. The latter appear to be comparatively steady. Most of distress goods is being offered out of New York at present time. No large orders were reported placed this week; bulk of trading consisted of distress lots offered in a few spots. White crude scale sold largely at 2.625 to 2.75 cents, New York, with one small lot reported sold at 2.62 cents. At New Orleans, no sales recorded under 2.75 cents a pound were made known.

Fully refined wax, 125-127 a.m.p., sold generally at 3.75 cents with one distress sale reported as low as 3.65 cents. Little demand was noted for the other grades.

Lubricating oil market remained relatively quiet. But few changes were noted in prices. Bright stock was offered approximately one cent lower than a week ago at 35 cents. Other oils were steady. Neutral oils were reported to be steadiest items on the list.

OIL STOCKS AND FINANCES

National Petroleum News

Better Trade in Sight, New York Bank Says in Business Review

NEW YORK, Nov. 25

BETTER business is in sight. There are unmistakable signs that the readjustments which have been under way for some months and which have been reflected in a rather dull situation are about finished, and that from now on a gradual increase of industrial and commercial activities may be expected, says the National Bank of Commerce of New York in its monthly review of business.

This statement is made with full recognition of the fact that business opinion in many lines is at present far from cheerful. That this should be so is not surprising, for various aspects of the situation leave much to be desired. There is considerable unemployment in important industrial centers. Automobile output has been curtailed further and retail sales of cars are not seasonally satisfactory. The tire manufacturers and accessories and parts makers, of course, have felt the effects of the low rate of automobile output.

"Chain-store and mail-order sales are exceeding those of last year, but department-store trade thus far has fallen below that of the autumn of 1926 in dollar values, in some measure because of delayed arrival of cold weather.

"Published earnings statements of many corporations for the third quarter of the year are none too good, when compared with what industry and commerce have become accustomed to expect of late. Lessened profits are the combined results of increasing competition, with lower prices for finished products, and of failure of volume to increase sufficiently to overcome the effects of narrower margins. The indications now are that, save in lines likely to prosper by reason of holiday trade, fourth-quarter earnings will not be better, comparatively, than were those of the third quarter, and in many cases it is likely they will fall below them.

"Cooler weather will probably bring better department-store trade. A factor of some possible importance in connection with Christmas buying is the redemption by the United States treasury of the Second Liberties, a considerable proportion of which is held in small amounts by original subscribers who took them through patriotic motives. While a substantial part of the proceeds will be reinvested it seems quite likely that some portion will find its way into consumptive channels, especially for the purchase of goods requiring cash outlays of some size such as automobiles, radios and furniture. Farmers will probably be better buyers during the next few months than they have been at this season for several years.

"While no sudden business boom is in sight, betterment, beginning as it should in the basic industries, will proceed gradually and probably slowly until the New Year is well under way. Readjustments in lines which have enjoyed active business while steel and automobiles were losing ground may for a time even appear to offset gains. But the trend is clearly toward prosperity in 1928."

Anglo-Persian Oil's Earnings Recede

NEW YORK, Nov. 26.—Anglo-Persian Oil Co., Ltd., netted £2,844,555 in the fiscal year ended March 31, 1927, equivalent after dividends on the first and second preference stocks to 14.60 per cent on the ordinary or common stock, reports of the company, published lately, reveal. In the preceding fiscal year the company netted 16.53 per cent on the ordinary stock. This is the company in which the British government invested funds.

The Anglo-Persian in the last fiscal year produced more than 4,800,000 tons of crude oil, approximately 33,600,000 barrels, in its main field in Persia, the company's chairman, Sir John Cadman, announced. This was a daily average of approximately 92,000 barrels. Production in the Argentine averaged approximately 3,000 barrels daily. The latter was sold locally.

In Persia the company has a natural gasoline plant that is handling about 10,000,000 cubic feet of gas daily and recovering 2½ gallons of gasoline per 1,000 cubic feet of gas.

The company has prospected in Albania, Sir John reported, but indications were not for commercial production, but ultimate prospects could not yet be ascertained.

The company is enlarging its tanker fleet and when the present program is completed it will have 83 vessels with total tonnage of 770,000 tons, Sir John said.

Income accounts for the fiscal years ended March 31 compare, the pound sterling having an exchange value of $4.87½ Nov. 25:

	1927	1926
Net prof aft depr, int & res	£4,635,443	£4,383,232
Expense bonus	40,595	.....
Extra depreciation	450,293	228,100
Reserves	1,300,000	1,800,000
Net profit	£2,844,555	£2,355,132
1st & 2nd pfd divs	875,000	875,000
Interim 5% com divs	671,250	447,500
Balance	£1,298,305	£1,032,632
*Common divs	1,006,875	1,118,750
Balance	£291,430	†£86,118
Brought forward	1,955,449	2,041,567
Carried forward	£2,246,879	£1,955,449

*In 1927, payable November 28, and in 1926, payable November 29. †Deficit.

Balance sheets of March 31 compare:

ASSETS

	1927	1926
Concessions, shrs in and adv to associated cost, etc.	£24,789,709	£21,880,439
*Property account	5,386,687	6,074,042
Stock of stores & materials, etc.	1,176,819	1,005,227
Stocks of crude oil, products, etc	2,977,443	3,145,636
Debit balances	4,448,983	4,368,736
Government securities	3,273,756	3,274,944
Cash	2,931,822	2,590,247
Total	£44,985,219	£42,339,271

LIABILITIES

†1st pref shares	£7,000,000	£7,000,000
†2nd pref shares	3,500,000	3,500,000
†Ordinary shares	13,425,000	8,950,000
Debenture stock	4,125,000	4,250,000
Secured notes	7,835,000	1,792,500
Interest accrued	55,806	62,834
Deposits by asso cos	1,043,252	430,591
Credit balances	3,775,294	2,766,002
Pension & insurance fund	2,206,734	1,745,017
Reserves	4,708,129	7,883,128
Profit & loss surplus	4,362,504	3,959,199
Total	£44,985,219	£42,339,271

*After depreciation. †Par value £1.

Gulf Coastal Lubes Firmer

HOUSTON, Nov. 28.—Gulf Coastal lubricant prices are firmer at the lower prices prevailing in the past 10 days. Winter demand has quickened jobber shipments but not to the same extent as in other years. Manufacturers are looking ahead to better movement with the coming of cold weather.

Transactions in Oil Shares on New York Stock Exchange

1926 High	1926 Low	1927 High	1927 Low		Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Sales	Week First	Week High	Week Low	Ended Last	Nov. 26 Change
32⅞	24¼	37⅝	27⅝	(sh)	916,675	N.P.	Amerada Corp.	50cQ	Oct. 30, 27	7,000	29⅞	30⅜	29½	30	0
74	39⅞	65⅝	35⅛	(sh)	209,180	N.P.	American Republics	.....	.....	122,700	50⅜	*65⅜	49	63	+13¼
59½	44¾	50¼	40	$	56,000,000	$25	Associated Oil	50cQ	Sept. 2, 27	.....	.....	.....	.....	.....	.....
128⅜	97	131⅜	107		50,000,000	100	Atlantic Refining	$1Q	Sept. 15, 27	38,800	118	118½	113½	114¼	— 4½
120	115½	118½	111½		20,000,000	100	do pfd	$1.75Q	Nov. 1, 27	.....	.....	.....	.....	.....	.....
33½	23½	35½	20¾		25,000,000	25	Barnsdall Corp. A	s62½cQ	Nov. 15, 27	79,800	26⅝	27⅛	24⅛	24¾	— 1
29½	22¼	32½	20½		3,842,400	25	do B	s62½cQ	Nov. 15, 27	600	26	26	24⅛	24⅛	— 1¼
68⅛	29¾	32⅞	20		51,523,950	25	California Petroleum	25cQ	Dec. 1, 27	12,300	23⅝	23⅝	22⅝	22⅝	— ⅞
94¼	50	96⅜	65		24,355,000	100	General Asphalt	.....	.....	22,200	84	85⅜	82⅝	83¾	0
140½	94⅞	144⅞	107¼		6,874,200	100	do pfd	$1.25Q	Dec. 1, 27	.....	.....	.....	.....	.....	.....
72	50¼	175¾	60⅛		25,000,000	100	Houston Oil	.....	.....	80,500	162⅜	165	157	159⅛	— 3⅜
84	19⅝	32¾	17⅝	(sh)	500,000	N.P.	Independent Oil & Gas	25cQ	Oct. 31, 27	9,000	25¾	25⅜	24¼	24⅞	— ⅜
13¾	7¼	12⅛	7½	$	3,280,340	$10	Indian Refining	.....	Dec. 15, 20	1,000	9¼	9¼	8¾	8¾	— ½
12½	8	12	7¼		4,550,110	10	do ctfs	.....	.....	100	8½	8½	8½	8½	— ¾
104	90	112	99		2,296,400	100	do pfd		Dec. 15, 21	.....	.....	.....	.....	.....	.....
24½	19⅛	36⅞	20½	(sh)	3,992,067	N.P.	Lago Oil & Transport	75cQ	Aug. 1, 27	11,200	36⅞	*36⅞	34¾	35½	— 1
19⅞	12	18⅛	10	(sh)	1,131,290	N.P.	Louisiana Oil Refining	.....	.....	2,600	11	11	10½	10½	— ½
98	93	97	86	$	4,000,000	$100	do pfd	$1⅝Q	Nov. 15, 27	220	88⅛	88⅛	88	88	0
28⅞	16½	22⅜	12	(sh)	330,000	N.P.	Maracaibo Oil	.....	.....	1,700	12½	13⅛	12⅛	12⅛	— ⅛
63⅜	49¼	58½	31	(sh)	2,316,401	N.P.	Marland Oil Co.	.....	Mar. 31, 27	23,800	36½	36½	35⅛	35⅜	— ⅜
250	225	250	200	$	45,942,800	$100	Mexican Petroleum	$3Q	Oct. 20, 27	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....		12,000,000	100	do pfd	$2Q	Oct. 20, 27	.....	.....	.....	.....	.....	.....
13¾	6	9¼	3	(sh)	945,839	N.P.	Mexican Seaboard	.....	Nov. 15, 24	2,500	6¾	6⅞	5⅜	6	— ½
37	27½	39⅜	25½	(sh)	1,357,800	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 27	6,600	28½	29⅛	28¾	28¾	— ⅛
104¼	90	105	97	$	6,718,000	$100	do pfd	$1.75Q	Dec. 1, 27	.....	.....	.....	.....	.....	.....
2½	¾	3¾	1⅝		24,435,000	10	Middle States	.....	July 1, 23	6,200	2½	2½	2¼	2¼	— ¼
1⅜	½	2¾	1⅛		5,356,660	...	do ctfs	.....	.....	1,400	1⅝	1⅝	1⅝	1⅝	— ⅜
2¼	1	1⅞	1	(sh)	3,500,000	N.P.	Pacific Oil	.....	.....	1,300	1¼	1¼	1⅛	1¼	— ⅛
76½	56½	65⅞	45⅛	$	48,807,500	$ 50	Pan American P. & T.	$1Q	Oct. 20, 27	2,900	50¾	50⅞	49¼	49½	— 1½
78⅜	56⅞	66⅜	45⅝		121,094,850	50	do B	$1Q	Oct. 20, 27	16,100	52¼	52⅜	50	50	— 2
46	30	37⅞	16¾	(sh)	400,000	N.P.	Pan American Western B.	.....	Jan. 30, 27	2,600	20¾	20¾	19¾	20	— 1
62	4½	18⅞	8	(sh)	198,770	N.P.	Panhandle P. & R.	.....	.....	4,000	14¼	15½	14¼	14½	— ¼
99⅜	51	83¾	58¾	$	2,935,200	$100	do pfd	.....	July 2, 23	800	80	80	76	76	— 6
57⅜	40	60¼	36½	(sh)	2,406,796	N.P.	Phillips Petroleum	75cQ	Oct. 1, 27	23,900	42⅞	42⅞	41⅝	41⅝	— ⅝
1⅞	½	1⅛	½	$	29,622,925	$ 25	Pierce Oil Corp.	.....	.....	1,400	¾	¾	½	½	0
27⅞	11⅛	24	13½		15,000,000	100	do pfd	.....	Feb. 1, 22	.....	.....	.....	.....	.....	.....
7	2¼	5½	2½	(sh)	2,500,000	N.P.	Pierce Petroleum	.....	.....	4,300	3¾	3¾	3½	3⅝	— ¼
20¾	11	33⅞	16¾	1	37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	12,000	26½	26¾	24	26⅝	— ⅜
41¾	30¾	50	36⅞		2,845,350	50	do pfd	.....	May 1, 25	290	42¾	42¾	41¾	42	0
31	25¼	33½	25		75,939,250	25	Pure Oil Co.	37½cQ	Dec. 1, 27	7,400	26	26⅛	25½	25⅝	— ⅜
112¾	106	114	111⅜		13,000,000	100	do 8½ pfd	$2Q	Oct. 1, 27	100	114	114	114	114	+ ¼
57⅜	47⅜	58	45	(sh)	616,605	13.40	Royal Dutch, N. Y. shares	$1.80	Aug. 2, 27	2,100	48½	48½	47¼	47½	— ½
40⅝	40½	47⅞	41⅜	(sh)	78,389	F2	Shell Transport & T	$1.45	July 22, 27	100	44	44	44	44	0
31	24	31⅜	24⅝	(sh)	10,000,000	N.P.	Shell Union Oil	35cQ	Sept. 30, 27	7,800	26¾	27	26¼	26½	— ½
114	103	111	107½	$	18,350,400	$100	do pfd	$1½Q	Nov. 15, 27	.....	.....	.....	.....	.....	.....
28⅝	15⅛	22⅜	14¼		7,208,080	10	Simms Petroleum	.....	Apr. 1, 27	4,400	19⅞	19⅞	19	19	— ¾
24⅞	16¾	22⅝	15	(sh)	4,501,339	N.P.	Sinclair Consolidated	.....	May 31, 24	23,600	16⅜	16¾	16¼	16¾	+ ½
99½	90	103¼	97	$	16,907,000	$100	do pfd	$2Q	Nov. 15, 27	600	97¾	99	97¾	99	+ ½
37⅛	26⅝	37⅜	24⅛		27,396,590	25	Skelly Oil Co.	50cQ	Sept. 15, 27	5,300	27½	27¾	26½	27¼	— ¼
63⅝	52⅝	60¾	50⅜	(sh)	13,016,434	N.P.	S. O. California	62½cQ	Sept. 15, 27	16,400	56⅛	56½	55¾	56	— ¼
46⅜	37⅜	43¾	35⅛	$	606,243,050	$25	S. O. New Jersey	‡25cQ	Sept. 15, 27	57,400	40⅜	40⅞	40	40⅜	0
33¼	32½	34⅛	29¾		424,348,275	25	S. O. New York	40cQ	Sept. 15, 27	29,900	32½	32½	32	32	— ⅜
41⅝	30⅛	34⅞	30	(sh)	1,171,508	N.P.	Sun Oil	25cQ	Sept. 15, 27	3,200	32⅞	33½	31	31	— ½
...	...	100¼	99	$	5,000,000	$100	do pfd	$1.50Q	Dec. 1, 27	400	100	100	100	100	— ¼
5¼	1	6½	3¼	(sh)	1,121,368	N.P.	Superior Oil Corp	.....	Dec. 20, 20	5,400	3⅜	3⅝	†3¼	3⅝	+ ⅛
57⅞	53⅛	58	45	$	180,428,225	25	The Texas Corp.	75cQ	Oct. 1, 27	30,300	53¼	53⅜	53	53¼	+ ⅛
19½	12	18⅞	12		8,380,340	10	Texas Pacific Coal & Oil	15c	Sept. 30, 27	2,600	13¾	13¾	13⅜	13½	— ¼
39¼	37	29⅛	19	(sh)	2,168,264	N.P.	Tide Water Oil Co.	20cQ	Sept. 30, 27	1,500	21⅞	23	21⅜	23	+ 1⅜
103	87¼	90⅛	85	$	20,705,200	$100	do 5½ pfd	$1.25Q	Nov. 15, 27	2,500	85½	86	85⅛	86	+ 1
....	....	19⅛	15⅜	(sh)	4,795,934	N.P.	Tide Water Associated	.....	Aug. 1, 27	8,800	16⅞	17	16½	16¾	— ¼
....	....	90¾	85	$	72,795,900	100	do pfd	$1.50Q	Oct. 1, 27	2,200	87½	87¾	87⅛	87¾	0
5½	3	10¼	3¾	(sh)	3,742,029	N.P.	Transcontinental Oil	.....	.....	87,700	10	10	9⅛	9¼	+ ½
58⅜	37¼	56½	39⅝	$	40,759,475	$25	Union Oil of Califirnia	50cQ	Nov. 10,27	3,200	44¼	45⅜	43⅞	44	— ¾
120⅜	84¼	121½	94		30,734,000	100	Union Tank Car Co.	$1.25Q	Dec. 1, 27	300	116¾	116¾	115¼	115¼	— 1
....	....	28½	24½	(sh)	240,000	N.P.	Warner Quinlan	50cQ	Oct. 1, 27	24,800	27	31¾	27	27½	+ 1
29¾	25⅛	27½	21¼	(sh)	490,000	N.P.	White Eagle Oil & Refining	50cQ	Oct. 20, 27	700	23	23	22¾	22¾	— ¼

*New High †New Low xEx-Dividend ‡Also extras s-Stock Total Sales 828,510

Oil Dividends

	Amount	Payable	Stock of Record
South Penn q...	50c	Dec. 31	Dec. 14
Phillips Pet. q.	75c	Jan. 3	Dec. 14

Cleveland Stock Market

November 25.

	Par Value	Bid	Asked	Last Sale
Canfield Oil Co.	100	.....	.....	.....
do pfd.	100	100	.....	100
Fred G. Clark	10	2	3½	2
National Refining Co.	25	35	38	33⅝
do pfd.	100	131	.....	130½
Paragon Refining Co.	25	8¾	9	8¾
do pfd.	100	.....	103	103¾

x Ex-Dividend.

Cities Service Earnings Higher

CLEVELAND, Nov. 26.—Net earnings of Cities Service Corp. for the 12 months ended Oct. 31 were $31,244,250, compared with $22,820,620 in the 12 months ended Oct. 31, 1926, an increase of 36 per cent. October earnings were the largest in the company's history, it reported.

PITTSBURGH STOCK EXCHANGE

1926 High	1926 Low	1927 High	1927 Low	Par Value	Stocks	Transactions Sales	Week First	Week High	Week Low	Ended Last	Nov. 25 Ch'ge
8½	5¾	9⅞	6⅞	$ 10	Arkansas Nat. Gas..	4,090	9¼	9¼	8⅞	9⅛	0
90½	79¾	98⅝	80⅞	100	Columbia Gas.....	.....	.....	.....	.....	.....	.....
101⅜	95	107⅞	100	100	do pfd.....	.....	.....	.....	.....	.....	.....
17	12½	15	7½	10	Devonian Oil.....	132	7½	8	†7½	8	— 1
116½	112	117½	115	100	Duquesne Lt. 7½ pfd.	108	117½	*117½	117½	117½	+ ½
10	5⅛	12¼	6	N.P.	Houston Gulf Gas..	830	10⅜	11	10⅜	11	+ 2
46	39	59¼	37¼	$25	Lone Star Gas.....	15,358	55⅜	*59¼	55⅜	58⅞	+ 2⅞
47⅜	33⅛	22¾	22¼	25	Ohio Fuel Corp.....	.....	.....	.....	.....	.....	.....
47½	42	21⅜	21	...	do ctfs.....	.....	.....	.....	.....	.....	.....
6¾	5	6	5	...	Ohio Oil & Gas.....	.....	.....	.....	.....	.....	.....
34	21	21	21	25	Oklahoma Nat. Gas..	.....	.....	.....	.....	.....	.....
21	19¼	23⅝	20¼	...	do ctfs.....	.....	.....	.....	.....	.....	.....
5⅜	3⅛	3⅞	3	5	Pittsburgh Oil & Gas	.....	.....	.....	.....	.....	.....
10	7½	8	5½	10	Salt Creek Cons.....	80	6⅞	7	6⅞	7	+ ¼
27	8	26½	17	10	Tidal Osage.....	.....	.....	.....	.....	.....	.....
45	40	43	33	N.P.	Waverly Oil Wks. "A"	75	33½	33½	33½	33½	0

PITTSBURGH CURB EXCHANGE

1926 High	1926 Low	1927 High	1927 Low	Par Value	Stocks	Transactions Sales	Week First	Week High	Week Low	Ended Last	Nov. 25 Ch'ge
3⅜	2½	3½	2¾	$ 5	Columbia Synd.....	.....	.....	.....	.....	.....	.....
20	.06	.18	.18	5	Duquesne Oil.....	.....	.....	.....	.....	.....	.....
91½	85	95	88	25	Gulf Oil Corp.....	.....	.....	.....	.....	.....	.....
79	79	105	93	100	Houston Gulf Gas pfd.	.....	.....	.....	.....	.....	.....
12	7½	10¾	5¾	N.P.	Leonard Oil & Dev...	2,300	5¾	5¾	†5¾	5¾	— 1¾
30¼	29	32	31¼	$ 25	Oklahoma Gas.....	.....	.....	.....	.....	.....	.....
2	.15	2.70	.50	10	Omar Oil & Gas.....	5,700	.60	.60	†.50	.50	— .25
....	....	2¼	1¾	....	Pittsburgh Oil Dev..	.....	.....	.....	.....	.....	.....
2	1¾	2¼	2¼	5	do pfd.....	.....	.....	.....	.....	.....	.....
33½	20	31	19	10	Plymouth Oil.....	650	23½	23¾	23	23	— ½
7	3	6	5	5	States Oil.....	.....	.....	.....	.....	.....	.....
3½	2	3⅛	1½	1	Texon Oil & Land...	7,280	2	3⅛	2	3⅛	+ 1¼
25¾	8	23¾	18	10	Tidal Osage (non-vtg).	.....	.....	.....	.....	.....	.....

*New high †New Low xEx-Dividend

Standard Oil Stock Traded in New York

1926 High	1926 Low	1927 High	1927 Low	Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended Nov. 25 Sales	First	High	Low	Last	Change
21	16⅜	21⅝	17⅜	£ 4,000,000	£1	Anglo-American Oil	60⅓c	May 31, 27	400	19⅛	19⅛	19⅛	19⅛	— ⅜
20¼	16½	20½	17⅜	.....	£1	do ctfs. non-voting	.....	.....	.....	.....	.....	.....	.....	.....
2¼	.75	3¾	.75	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	.4,500	1⅞	3¾	1⅞	3	+ 1
5	2⅜	6½	2½	$ 000,000	$ 10	do pfd	.....	.....	1,400	5	6½	4⅞	6½	+ 2
75	65	69	50	1,000,000	25	Borne Scrymser	‡$1S.A.	Oct. 15, 27	.....	.....	.....	.....	.....	.....
59½	42	60	45	10,000,000	50	Buckeye Pipe Line	$1Q	Sept. 15, 27	500	59½	59½	59⅛	59⅛	— ⅜
82½	65	126	76½	3,000,000	25	Chesebrough Mfg	$1Q	Sept. 30, 27	.....	.....	.....	.....	.....	.....
25⅞	17½	22⅝	16¼	38,805,260	10	Continental Oil	25cQ	Sept. 15, 27	21,800	18½	18⅞	18⅝	18½	— ⅜
137	102	137	89	3,000,000	100	Cumberland Pipe Line	$2Q	Sept. 15, 27	.....	.....	.....	.....	.....	.....
63¾	43	66⅛	47	5,000,000	100	Eureka Pipe Line	$1Q	Nov. 1, 27	250	65	66½	65	66½	+ 1½
32½	9⅛	13½	6½	16,000,000	100	Galena Signal Oil	.....	June 30, 25	100	7¼	7⅝	7¼	7⅝	— ⅜
94½	35	59¾	31	4,000,000	100	do new pfd	.....	June 30, 26	100	33	33¼	33	33¼	0
97½	40	60½	36	2,000,000	100	do old pfd	.....	June 30, 26	150	45	45	45	45	0
99⅛	52	68¼	54	73,117,577	25	Humble Oil & Refining	‡30cQ	Oct. 1, 27	19,300	68	68¼	66	67	— ¾
144½	125¼	182	123¾	20,000,000	100	Illinois Pipe Line	$6S.A.	June 15, 27	2,050	180	182	177	181¾	+ 5¾
39¾	32½	64¾	37¾	(sh) 6,491,952	N.P.	Imperial of Canada	‡25cQ	Dec. 1, 27	2,000	60½	60½	59⅝	59⅝	— ⅞
70	54¼	92	61	$ 5,000,000	$50	Indiana Pipe Line	‡$1Q	Nov. 15, 27	1,800	88	92	88	92	+ 3
35¼	28¾	34⅞	28	(sh) 7,118,138	N.P.	International Petroleum	25c	Nov. 15, 27	13,500	33¼	33¼	32¼	32⅝	— ¼
20¾	12½	24	13½	$ 6,362,500	$12½	National Transit Co	25cQ	Sept. 15, 27	6,700	22⅞	24	22⅝	23⅜	+ ⅜
51½	27⅞	44⅛	31¼	5,000,000	100	New York Transit	.....	July 15, 26	150	43¼	42¾	42½	42½	— ¾
80½	64	98	70	4,000,000	100	Northern Pipe Line	$3S.A.	July 1, 27	350	95¼	98	95¼	97½	+ 1½
67⅛	55¾	67⅞	52	60,000,000	25	Ohio Oil Co	‡50cQ	Sept. 15, 27	43,900	65	67⅞	64½	66	+ ¾
24¾	15	38½	12	10,000,000	25	Penn Mex. Fuel	.....	May 21, 25	1,900	35	35⅛	33¾	34½	— ½
60¼	48	55½	45⅝	60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	12,600	50¼	50½	48⅝	48¾	— 1¾
137½	122¼	190	132	81,000,000	100	Prairie Pipe Line	$2.50Q	Oct. 31, 27	1,000	186½	186¾	183	183	— 3½
220	184½	201½	175½	4,000,000	100	Solar Refining	$5S.A.	June 20, 27	50	192	190	185½	185½	— 6½
27	21	27¼	15½	5,000,000	50	Southern Pipe Line	$2	Dec. 1, 27	100	22	22	22	22	+ ⅛
50	34½	41⅛	34½	20,000,000	25	South Penn Oil	50cQ	Sept. 30, 27	1,900	39½	39½	38⅞	39¼	— ¼
57	49	111½	111⅜	3,500,000	100	South West Pa. Pipe Lines	$1Q	Oct. 1, 27	40	111½	111½	111⅜	111⅜	+ 1½
70½	60½	81½	64¾	228,415,463	25	S. O. Indiana	‡62½cQ	Sept. 15, 27	46,800	80⅛	81⅛	80½	80	— ⅝
36½	16½	20⅞	15½	8,000,000	25	S. O. Kansas	...	June 16, 24	1,900	16⅛	16⅝	16⅛	16¼	— ½
134¾	108	130	111½	17,012,599	25	S. O. Kentucky	$1Q	Sept. 30, 27	1,500	125	128⅛	125	126⅜	— ⅝
51⅛	42	49½	42	4,559,850	25	S. O. Nebraska	63cQ	Sept. 20, 27	400	44½	44½	43¼	43¼	— 1¼
672	288	863¾	73	14,000,000	25	S. O. Ohio	62½cQ	Oct. 1, 27	2,250	81	84	78½	83½	+ 7
120½	116½	122	117¼	7,000,000	100	do pfd	$1.75Q	Dec. 1, 27	.....	.....	.....	.....	.....	.....
23	15½	127	14½	861,466	25	Swan Finch Co	.....	Nov. 1, 19	50	120	127	125¾	127	+ ½
109¾	90¼	149⅞	95⅛	62,470,800	25	Vacuum Oil	‡50cQ	Sept. 20, 27	46,900	148½	149⅞	105½	107	— 1

*New high †New low xEx dividend ‡Also extras.

New York Curb Bonds

Week Ending Nov. 25

	High	Low	Last	Ch'ge
Beacon Oil 6s '36	100½	100	100¾	— ¾
Cities Service 5s, '66	90	89¾	90	0
Cities Service 6s '66	103¾	103	103⅛	— ⅛
Cities Service G 5½s '42	95⅛	94⅞	95⅛	0
Empire Oil 5½s wi	93⅞	93⅜	93⅞	+ ⅜
Galena S. O. 7s '30	93½	93¼	93½	+ ½
Gulf Oil 5½s '28	100¼	100¼	100¼	+ ¼
Gulf Oil 5s '37	102	101¾	102	+ ½
Independent Oil 6s '39	95⅜	95	95	— ⅜
Phillips Pet. 5¼s '39	95¼	95	95	— ¼
Pure Oil 6½s '33	102⅞	102⅞	102⅞	0
Richfield Oil 6s wi. '41	98⅞	97⅛	97⅛	— ⅝
S. O. of N. Y. 6½s '33	104½	104	104¼	+ ⅛
S. O. of N. Y. 4½s '51	.....	.....	.....	.....
Sun Oil 5½s '39	101½	101¼	101¼	0
Tidal Osage 7s '31	.....	.....	.....	.....
Trans. Cont. Oil 7s '30	117	114½	115	—2
Warner-Quin. 6s'42	98⅛	97½	98	+1

New York Bonds

Week Ending Nov. 25

	High	Low	Last	Ch'ge
Amer. Rep. deb. 6s	101⅝	101⅝	101⅝	0
Assoc. Oil gold 6s	103⅜	102¾	103⅜	+ ⅛
Atlantic. Refg. deb. 5s	103	103	103	0
Barnsdall Corp. 6s	103	100⅜	100⅞	—1¾
Barnsdall Corp. 6s ex-war.	91	90½	90¾	— ¼
Cal. Pet. 5s	95⅝	95¼	95⅝	+ ⅜
Cal. Pet. 5½s	100½	100¼	100½	+ ⅛
General Asphalt 6s	111	110½	110½	— ⅝
General Petroleum 5s	102¼	102	102¼	+ ¼
Humble Oil & Refg. 5½s	102¾	102⅜	102½	— ¼
Humble Oil 5s	100¼	100	100⅛	+ ⅛
Mid-Cont. Pet. 6½s	105¼	105¼	105¼	0
Pan Amer. P & T 7s	105⅜	105⅜	105⅝	— ⅛
Pan Amer. P & T 6s	103½	103⅛	103⅛	0
Pan Amer. P & T 6s	97¼	96¾	96¾	— ¼
Prod. & Refiners 6s	112	111¾	111⅝	— ¼
Shell Union Oil 5s	98½	98	98½	0
Simms. Pet. cvt. 6s	102	101¾	101¾	— ¼
Sinclair Con. Oil Col. 7s	98⅝	98¾	99⅝	+ ⅝
Sinclair Con Oil Con. 6½s	94¾	94	94¼	— ⅜
Sinclair Con. Oil 6s-D	97½	96	96½	— ¼
Sinclair Crude Oil 6s	100⅜	100⅛	100⅛	— ¼
Sinclair Pipeline 5s	94⅛	93½	94⅛	+ ⅜
Skelly Oil 5½s	95	94½	94⅝	— ⅜
S. O. of N. Y. 4½s	97¾	97¼	97½	0
S. O. of N. J. deb. 5s	104⅜	104	104⅛	0
Union Oil of Cal. 6s-A	109½	109½	109½	+ ⅝
Union Oil of Cal. 1st 5s	101¾	101⅝	101¾	0
Union Oil of Calif. 5s-C	99⅛	99	99	+ ⅛
White Eagle 5½s war	95¼	95¼	95¼	0

New York Curb Market

1926 High	1926 Low	1927 High	1927 Low	Par Value	Stocks	Transactions Week Ended Nov. 25 Sales	First	High	Low	Last	Change
6¾	45	2¼	.55	$5	Amer. Con. Oilfields	20,100	.85	.85	.80	.83	— .02
14½	4	7½	3	N.P.	Amer. Maracaibo	3,300	3¼	3⅜	3⅛	3¼	+ ⅛
8⅜	5⅜	9¾	6¾	$10	Arkansas Nat. Gas	1,600	9¼	9¼	9	9⅛	— ⅛
20⅜	14⅛	20½	15½	N.P.	Beacon Oil	.....	.....	.....	.....	.....	.....
85¼	60	36¼	20½	N.P.	British American	400	36	36	35½	35½	— ⅜
28⅜	9¼	28¼	14⅜	25c	Carib Syndicate(new)	3,200	20¾	20¾	19½	19½	— ¾
....	....	26	16½	...	do ctfs. of deposit	.....	.....	.....	.....	.....	.....
51	37½	58¾	40¼	$20	Cities Service	20,100	51	52	50¾	51¾	+ ¾
92½	82⅜	95	87	100	do pfd	1,000	94½	94⅝	94½	94⅝	0
8¾	7⅜	8⅝	7⅜	10	do pfd. B	500	8¾	8¾	8¾	8¾	+ ⅛
25¼	19	29¼	22½	10	do banker's shares	.....	.....	.....	.....	.....	.....
3½	1¾	3⅛	1¾	$1	Colombia Syndicate	8,800	1⅛	1⅛	1¾	1¾	— ⅛
10⅛	8⅛	9½	6⅛	10	Consolidated Royal	.....	.....	.....	.....	.....	.....
16	10	14⅞	9⅞	N.P.	Creole Syndicate	12,500	10⅜	10⅞	10¼	10½	0
7⅝	1⅛	3	x63	N.P.	Crown Central	300	.80	.80	.75	.75	— .01
8½	½	12	4	...	Darby Petroleum	.....	.....	.....	.....	.....	.....
....	....	11⅛	5	...	do trust ctfs	.....	.....	.....	.....	.....	.....
4	1¾	2½	1¼	N.P.	Derby Oil & Refining	.....	.....	.....	.....	.....	.....
19	13	16¾	7⅛	N.P.	do pfd	.....	.....	.....	.....	.....	.....
7½	2⅜	3¾	1	N.P.	Gibson Oil	1,800	1⅝	1⅞	1⅝	1¾	— ¼
2	.63	1⅝	40	N.P.	Gilliland ctfs	.....	.....	.....	.....	.....	.....
98	82	105	86¼	$25	Gulf Oil Corp	13,100	103½	105	103¼	104¼	— ¼
3⅜	1	2¼	1⅛	N.P.	Kirby Petroleum	1,700	1⅝	2	1⅝	1⅞	+ ¼
12¼	5¾	10⅞	5⅛	N.P.	Leonard Oil & Dev	13,000	6	6½	6	6	0
27	20	27⅛	20	N.P.	Lion Oil & Refg	1,300	22⅜	22⅞	22	22	— ⅛
46	31	59⅜	37	$25	Lone Star Gas	12,700	55⅝	59⅜	55⅝	59	+ 2¼
2¾	2	2⅞	.87	1	Magdalena Synd	3,500	1½	1⅝	1⅛	1½	0
5½	1⅞	3	1⅛	10	Mexican-Panuco	.....	.....	.....	.....	.....	.....
1¾	1¼	1½	1	1	Mountain & Gulf	300	1⅜	1⅜	1¼	1¾	+ ¼
26	23	26⅞	22¾	10	Mountain Producers	5,900	25	25¼	24⅞	25	0
6¾	5	5⅞	4⅝	5	New Bradford	700	4⅞	5	4⅞	5	+ ⅛
11¾	2	6¼	4	10	New England Fuel	.....	.....	.....	.....	.....	.....
17	9⅛	16	9¼	1	New Mex. & Ariz	1,000	9⅝	10	9⅝	9⅝	0
17	8	13⅛	9	25	New York Oil	300	11⅛	11½	11⅛	11½	+ ⅜
12⅛	8¾	12⅝	10	N.P.	North Cent. Texas	100	10½	10¼	10¼	10¼	— ¼
44¾	33	....	....	$25	Ohio Fuel Corp	.....	.....	.....	.....	.....	.....
33	28⅛	27½	21¼	...	Okla. Nat. Gas ctfs	.....	.....	.....	.....	.....	.....
10⅛	5⅞	9⅜	1¾	N.P.	Pandem	7,000	4½	4½	3¾	3¾	— ¼
12¼	11¾	12⅛	7	N.P.	Pantapec Oil	1,800	8⅛	8½	8⅛	8½	+ ½
2¾	.20	.37	.25	N.P.	Peer Oil Corp	.....	.....	.....	.....	.....	.....
22¾	12	13½	7⅛	$10	Pennok Oil	.....	.....	.....	.....	.....	.....
38	14⅛	24⅝	12	25	Red Bank Oil	100	12	12	12	12	— 1
30¼	12	15½	2	N.P.	Reiter-Foster	5,600	7¾	7⅞	6¾	7	— ⅝
27½	22	27½	15	$25	Richfield Oil	6,100	24⅜	24¾	24	24	— ⅜
7½	4½	7	4½	N.P.	Ryan Consolidated	.....	.....	.....	.....	.....	.....
10	7½	8	6	$10	Salt Creek Cons	.....	.....	.....	.....	.....	.....
36	26⅛	32	27¼	10	Salt Creek Prod	1,400	30½	30¾	30¼	30¾	+ ⅜
4⅜	1⅛	7	2	5	Savoy Oil	.....	.....	.....	.....	.....	.....
27	7⅝	26⅛	17	10	Tidal Osage	800	21	21⅜	20¾	20¾	— ⅝
25¾	7⅝	23¾	15	10	do non-voting	1,100	18⅝	19½	18⅝	18¾	+ ⅛
...	3	89	63½	100	Transcontinental pfd	1,300	89	89	86	86	— 1
3	4⅛	7⅜	4¼	5	Venezuelan Petrol	1,000	5	5½	5	5	0
31½	22	32⅝	20⅜	N.P.	Wilcox Oil & Gas	900	23	23¼	23	23	0
9½	4⅝	8	4¾	$1	Woodley Petroleum	.....	.....	.....	.....	.....	.....

*New High †New Low xEx Dividend